

EXAMINING THE ROLE OF KNOWLEDGE IN AFFECTING GREEN FOOD CONSUMPTION BEHAVIOR AMONG WOMEN CONSUMERS FROM BEIJING CITY, CHINA

Qinglu Qiu

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
Program in Management
Rattanakosin International College of Creative Entrepreneurship
Rajamangala University of Technology Rattanakosin
Academic Year 2026
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2026



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Title of Thesis Examining the Role of Knowledge in Affecting Green Food Consumption Behavior among Women Consumers from Beijing City, China
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ABSTRACT

The objectives of this study were (1) to investigate the impact of subjective knowledge and objective knowledge on Chinese women's green food consumption behavior, (2) to analyze the influence pathways of subjective knowledge and objective knowledge on health belief (perceived benefits, perceived barriers, perceived susceptibility, perceived severity), (3) to evaluate how health beliefs (perceived benefits, perceived barriers, perceived susceptibility, and perceived severity) and cues to action influenced Chinese women's green food consumption behavior, and to clarify the mediating roles of these belief-based mechanisms between knowledge and behavior, and (4) to examine how demographic factors (marital status, education level, average monthly income, and age) shape Chinese women's green food consumption behavior.

This study adopted a quantitative research design. Using a non-probability, multi-stage sampling strategy that combined purposive sampling with age-based and quota sampling, the study collected data from 676 female residents in Beijing who had prior experience purchasing green food through an onsite survey. For data analysis, software was employed for descriptive statistics, confirmatory factor analysis (CFA) and structural equation modeling (SEM), including the estimation of direct paths and the indirect (mediating) effects, as well as a differential analysis.

Major findings: (1) On the issue of the first objective, neither subjective nor objective knowledge had a significant direct effect on Chinese women's green food consumption behavior; however, both showed meaningful indirect effects through belief-based mechanisms, indicating a knowledge–behavior gap bridged by health beliefs and related motivational processes; (2) On the issue of the second objective, subjective knowledge was strongly associated with benefit–barrier appraisals, whereas objective knowledge is more closely linked to risk-related beliefs; (3) On the issue of the third objective, perceived benefits and cues to action positively predicted green food consumption behavior, while perceived barriers negatively predicted it; mediation tests further confirmed health beliefs as key transmission mechanisms between knowledge and behavior; (4) On the issue of the fourth objective, green food consumption behavior differed across demographic segments, with higher levels observed among women with higher education and income, suggesting that socioeconomic resources shaped the translation of knowledge and beliefs into behavior.

Keywords: Green food consumption behavior, Chinese women, Health beliefs, Knowledge-behavior gap

Advisor's Signature .....

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List of Abbreviation and Glossary

Abbreviation / Glossary	Explanation
AGFI	Adjusted Goodness-Of-Fit Index
AVE	Average Variance Extracted
CA	Cues to Action
χ^2/df	Chi-Square To Degrees Of Freedom Ratio
CGFDC	China Green Food Development Center
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Confidence Interval
CR	Composite Reliability
GCB	Green Food Consumption Behavior
GFI	Goodness of Fit Index
GMOs	Genetically Modified Organisms
HBM	Health Belief Mode
IFOAM	International Federation of Organic Agriculture Movements
KAB	Knowledge Attitude Behavior
KAP	Knowledge Attitude Practice
KMO	Kaiser Meyer Olkin
NFI	Normed Fit Index
OK	Objective Knowledge
β	Path Coefficients
PB	Perceived Benefits
PBA	Perceived Barriers
PS	Perceived Susceptibility
PSV	Perceived Severity
RMSEA	Root Mean Square Error Of Approximation
S.D.	Standard Deviation
SDGs	Sustainable Development Goals
S.E.	Standard Errors

List of Abbreviation and Glossary (continued)

Abbreviation / Glossary	Explanation
SEM	Sructural Equation Modeling
SK	Subjective Knowledge
TLI	Tucker-Lewis index
UNCED	United Nations Conference on Environment and Development

CHAPTER 1
INTRODUCTION

This chapter serves as the starting point of this comprehensive study, offering a thorough exposition of the study topic. It begins by outlining the background of the study, exploring various aspects of green food consumption, including the rapid development of the green food market, the behavioral characteristics of women in food consumption, and the role of knowledge in influencing individual purchasing choices in health-driven contexts. This chapter also delves into relevant academic literature, laying a solid foundation for the present study.The significance of this study lies in its theoretical and practical contributions. On the theoretical level, it fills gaps in the existing literature and provides a deeper understanding of the multiple factors influencing Chinese women's decisions to purchase green food in health-driven contexts, as well as the interactions among these factors. Practically, by examining how knowledge influences Chinese women's green food consumption, this study aids businesses in optimizing marketing strategies, enhancing product awareness, and improving purchase conversion rates. The research questions and objectives outline the core issues guiding this study and the goals it seeks to achieve. These elements provide clear direction and boundaries for the research, ensuring its focus and goal-oriented nature.

1.1 Background of the Study

1.1.1 Research Problem Statement

Food systems represent a critical component in achieving sustainable development, encompassing the entire process from production to consumption and waste management (Rajic et al., 2022). With the global population projected to reach 9.7 billion by 2050, traditional agricultural production models—though boosting food supply—have led to urgent issues like resource overuse and environmental pollution (Jebari & Engström, 2025). In pursuit of healthier and more eco-friendly food systems, many countries are promoting agricultural transitions focused on food security, nutritional improvement, and climate resilience to reduce resource consumption and environmental impact (Varzakas &

Antoniadou, 2024). Against this backdrop, the concept of sustainable food has gained growing attention. Introduced in the 1992 United Nations Conference on Environment and Development (UNCED), sustainable food refers to food produced with consideration for environmental protection, economic viability, and social equity (Chu et al., 2023). Broadly speaking, it includes two main types: one based on traditional agricultural practices, such as green and organic food, and the other relying on technological innovation, such as cell-cultured meat. These approaches represent distinct pathways to achieving sustainability in food systems.

In China, the promotion of green food has become a key initiative in driving the transformation of the food system and offers a valuable reference for other developing countries (Fei et al., 2023). Compared to internationally standardized organic food regulations, China's food certification system is more complex and multi-tiered (Xu et al., 2020). Chinese green food refers to non-polluted, safe, high-quality, and nutritious products produced with the aim of protecting agricultural ecosystems and enhancing the quality of agricultural and processed products, thereby supporting the sustainable development of the national economy and society (Tan et al., 2022). Green food in China is classified into AA and A grades. AA-grade green food, which meets the highest standards, is comparable to organic food, while A-grade food represents a “compromised path” between organic and conventional safe food, adopting a more moderate approach in chemical input control (Qi & Ploeger, 2021). Although AA-grade green food and organic food share several characteristics, including the restriction or elimination of synthetic fertilizers, pesticides, and other chemical inputs, they are not fully equivalent. Organic food is regulated by internationally standardized certification systems, such as those set by the International Federation of Organic Agriculture Movements (IFOAM), and typically requires a conversion period, comprehensive traceability protocols, and third-party audits (Kononets et al., 2023). In contrast, AA-grade green food is certified under a separate national framework developed by the China Green Food Development Center. While the requirements are rigorous and overlap with some organic standards, differences remain in certification procedures, regulatory criteria, and international recognition.

In recent years, driven by supportive government policies, China’s green food market has seen remarkable growth. According to the China Green Food Development Center (CGFDC), domestic sales of green food reached RMB 585.657 billion in 2023, an

increase of RMB 45.9 billion over 2022, and more than five times the sales of organic food during the same period (CGFDC, 2024). This growth indicates that green food has moved beyond a niche market and is increasingly embraced by mainstream consumers. Despite the strong market performance, actual consumer purchase behavior is still constrained by multiple factors such as price, information asymmetry, and lack of trust in certification standards (Chen et al., 2023; Schrobback et al., 2023). Appropriate product information can effectively reduce perceived uncertainty and enhance purchase intention (Wu et al., 2021). In China, the complexity of the green food certification system and limited consumer awareness and trust in different certification levels exacerbate uncertainties in the decision-making process (Dong & Jiang, 2022). Such complexity not only affects purchasing decisions but may also hinder the healthy development of the green food market. Therefore, it is necessary to study the influence of consumers' awareness of green food on their purchasing behavior.

Notably, modern Chinese women have become a core driver of the country's new consumption era, with rising economic status and a growing focus on quality of life (Xu, 2024). Their unique role in Chinese household food consumption makes them a critical target group for China's green food market: as primary purchasers and decision-makers in family dietary matters (Yang et al., 2025), they directly shape household food choices—further underscored by a domestic scale of nearly 400 million 20-60-year-old female consumers, with the market valued at a potential US$10 trillion (Chen, 2022). This positions them as key stakeholders for China's green food, which has gained prominence in urban Chinese markets for its safety, traceability, and ecological attributes.

A key reason for Chinese women's focus on green food lies in their dual vulnerability to foodborne risks in China and their culturally rooted responsibility for family health. Using the Health Belief Model (HBM), this focus can be understood through the lens of perceived susceptibility and perceived severity of foodborne risks. Globally, foodborne diseases cause ~600 million illnesses and 420,000 deaths yearly (Keddy et al., 2025), but in China—amid rapid agricultural modernization—the risks are particularly acute, with frequent reports of food safety incidents related to pesticide residues and pathogenic contamination (Hashemi et al., 2023; Xu et al., 2020). For Chinese women, the HBM framework reveals how their roles as primary household meal preparers—responsible for handling raw ingredients and managing food storage—lead to heightened

exposure to potential pathogens (Saeed et al., 2021). Pregnant and lactating Chinese women face heightened biological risks, with local studies noting higher susceptibility to foodborne infections that may harm fetal development (Grace, 2023; Mafe & Büsselberg, 2024). Incorporating the concept of perceived benefits, Chinese women's cultural responsibility for family dietary safety drives them to adopt green food as a preventive measure, as these products promise safety and reduced exposure to harmful chemicals. However, the decision-making process is also influenced by perceived barriers, such as cost and availability, as well as the psychological pressure to protect children and elderly relatives, especially amidst public anxiety about food safety (Migheli, 2021; Zheng et al., 2023). In this context, China's green food—with its stringent certification standards, reduced chemical inputs, and government-regulated traceability systems—becomes a viable solution to mitigate these risks, aligning with women's health beliefs and actions.

While Chinese women generally prefer green food, their consumption behavior varies by group within China and is hindered by a critical contradiction. In urban China—where awareness of sustainable food is higher—better-educated women with stable incomes and strong access to digital information (e.g., via parenting apps or nutrition platforms popular in China) exhibit more proactive choices: they check official green food certification labels, review ingredient lists, and consult domestic nutrition bloggers (Qiu et al., 2025). Their behavior is driven by clear "health expectations" tied to family well-being, a priority deeply rooted in Chinese cultural values (Sloan, 2024). Yet even this urban group faces a distinct "motivation-behavior gap" in China's green food market: despite positive attitudes, their consumption is discontinuous, with fluctuations tied to confusion about China's multi-tiered green food certification system. Beyond practical barriers like higher prices of green food in Chinese supermarkets, this gap stems primarily from flawed knowledge structures specific to China's market context. Many Chinese women overestimate their understanding of China's green food standards, making errors like confusing domestically labeled "green vegetables" (a common marketing term) with officially certified green food, mistaking "ecological farm" packaging for China Green Food Development Center (CGFDC) certification, or trusting uncertified "green-themed" products promoted on Chinese short-video platforms like Douyin (Mota-Gutierrez et al., 2024).

This error reflects a mismatch between subjective and objective knowledge of China’s green food system—two key dimensions of consumer cognition. For Chinese consumers, subjective knowledge refers to self-perceived mastery of China’s green food standards (e.g., "I understand what China’s green food means"), while objective knowledge denotes verifiable expertise in China’s specific certification framework (e.g., distinguishing AA/A-grade green food, recognizing CGFDC marks, or understanding differences between China’s green food and organic standards) (Lu et al., 2025; Qiu et al., 2025). Most consumers exhibit "high subjective-low objective" knowledge in this domain, meaning even strong health beliefs ("China’s green food protects my family") fail to translate into stable behavior amid China’s fragmented food information environment and complex certification labels. Thus, this study examines how dual-dimensional knowledge of China’s green food system shapes consumption behavior via health beliefs among Chinese women: this exploration will clarifies the "attitude-behavior gap" mechanism specific to China’s market and provide support for targeted strategies—such as simplifying certification communication or enhancing consumer education on CGFDC standards—in China’s green food sector.

In the context of such a knowledge structure, even if females possess strong health beliefs—that is, the conviction that certain dietary behaviors, such as purchasing green food, are beneficial to their own and their family's health.—these beliefs may struggle to translate into stable consumption behaviors due to issues like inaccurate judgment criteria or unreliable information sources. Particularly in a market environment characterized by fragmented information and complex labeling, the misalignment of knowledge and health beliefs may form a critical psychological pathway influencing consumers' final decision-making outcomes.

Therefore, examining whether and how subjective knowledge level and objective knowledge level influence female consumers' green food consumption behavior by affecting health beliefs from a dual-dimensional perspective contributes to a deeper understanding of the mechanism behind the "attitude-behavior gap" phenomenon. This study attempts to identify the intrinsic relationships among female consumers' cognitive structures, belief expressions, and behavioral decision-making in real consumption contexts, aiming to provide theoretical foundations and empirical support for guiding

strategies in the green food market, as well as pathways for consumer knowledge education and risk communication.

1.1.2 Research Gaps

The increasing demand for green food, particularly in health-conscious urban populations such as female consumers in China, underscores the need to understand the psychological mechanisms that link knowledge to consumption behavior. However, existing studies reveal several important research gaps, particularly in relation to the explanatory models and the role of knowledge structures in decision-making. This study aims to identify and address the following study gaps:

Research Gap 1:Reliance on single theoretical framework

Existing studies on green food consumption largely rely on one theoretical lens, either knowledge–attitude–behavior (KAB) model or the health belief model (HBM). The KAB model emphasizes linear cognitive pathways from knowledge to behavior (Etwaroo et al., 2023; Teo et al., 2023), while HBM focuses on health-related motivations such as perceived risks and benefits (Febian et al., 2021; Singh et al., 2025). However, these frameworks are seldom integrated, leading to fragmented explanations. In practice, green food consumption involves both rational processing and emotional health drivers. For example, consumers may purchase green food due to nutritional understanding (knowledge-driven) or family health protection (belief-driven). KAB often overlooks affective factors, while HBM underemphasizes the acquisition and processing of knowledge. Moreover, most applications use simple linear structures, failing to test complex mediating mechanisms. This study addresses the gap by constructing a hybrid framework that embeds HBM constructs (susceptibility, severity, benefits, barriers) as mediators within the KAB model, offering a more comprehensive explanation of how cognitive and affective mechanisms jointly shape behavior.

Research Gap 2: Ambiguity in the "attitude" construct

In existing research applying the knowledge-attitude-behavior (KAB) model to food-related decision-making, the concept of "attitude" is often treated as a broad evaluative disposition—typically measured by general agreement with statements such as "I think green food is good" or "I support healthy eating" (Andika & Setyanta, 2024). While such measures capture individuals' overall orientation, they lack the specificity needed to explain why and how individuals are motivated to take action (Nam & Pak,

2023). Without disaggregation, these differences remain hidden. To address this, recent studies suggest reconceptualizing “attitude” through HBM’s four constructs: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Nam & Pak, 2023). Embedding these measurable health belief constructs within KAB allows clearer modeling of the psychological pathways through which knowledge translates into consumption behavior, overcoming the long-standing vagueness in attitude measurement.

Research Gap 3: Limited differentiation of subjective vs. objective knowledge

Although scholars increasingly distinguish between subjective knowledge of consumers’ self-perceived understanding and objective knowledge of factual accuracy compared against expert-defined standards—this differentiation is still underutilized in studies of health-related food consumption. Many works continue to treat knowledge as a unidimensional construct, limiting insights into decision-making processes (Fatha & Ayoubi, 2023; Zheng et al., 2022). Some consumers may feel confident in their knowledge (high subjective knowledge), confidently selecting “eco-friendly” or “natural” products without understanding certification standards (low objective knowledge) (Fatha & Ayoubi, 2023). Conversely, others may possess solid objective knowledge of certification and traceability systems but hesitate to purchase due to lack of confidence in applying it (Zheng et al., 2022). Both subjective and objective knowledge influence behavior differently: subjective knowledge shapes confidence and perceived control, while objective knowledge supports analytical evaluation. However, their combined and interactive roles remain underexplored in relation to health beliefs and purchasing outcomes. This study addresses the gap by independently operationalizing and measuring both knowledge types to examine their distinct and joint influence on women’s green food consumption in China.

1.2 Significance of the Study

This study explores the role of knowledge on consumption behavior of Chinese female toward green food, offering an important perspective for understanding the driving forces behind sustainable consumption. As consumer awareness of environmental protection and health continues to rise, knowledge plays an increasingly pivotal role in shaping consumption behavior, particularly in the context of green food. This study not

only enriches the theoretical framework of green food consumption behavior but also provides practical guidance on how to promote the widespread adoption of green food.

1.2.1 Theoretical Significance

This study makes several theoretical contributions to the fields of consumer behavior, health psychology, and sustainable food systems. First, it advances the knowledge–attitude–behavior (KAB) model by explicitly distinguishing between subjective knowledge (self-perceived understanding) and objective knowledge (accurate and factual knowledge). Traditional applications of KAB often assume knowledge as a unidimensional construct that uniformly drives attitudes and subsequent behaviors (Fatha & Ayoubi, 2023). However, recent findings suggest that subjective knowledge and objective knowledge exert different, and sometimes contradictory, effects on consumer choices (Rihn et al., 2021). By operationalizing and testing both knowledge types independently, this study enriches the KAB framework with greater conceptual precision and enhances its predictive validity in the context of sustainable food consumption.

Second, this study contributes to the health belief model (HBM) by embedding it within a broader cognitive-behavioral structure. While HBM has been widely used to predict preventive health behaviors such as vaccination or diet control , its application to green food consumption is still limited (Martey, 2024; Wang et al., 2024). By positioning perceived susceptibility, severity, benefits, and barriers as mediators between knowledge and consumption, this study reconceptualizes “attitude” in KAB with measurable health belief constructs. This integrated framework addresses the longstanding critique that KAB’s “attitude” dimension lacks clarity and operationalization (Nam & Pak, 2023).

Third, by integrating the KAB and HBM frameworks, this study moves beyond fragmented explanations and provides a nuanced, robust model that not only shows what factors influence green food consumption among Chinese women but also a clear pathway for how knowledge translates into action, thereby offering a crucial roadmap for both business and policy strategies. Prior research has tended to privilege either rational choice models that emphasize information and awareness or psychological health frameworks that stress perceived risks and benefits (Etwaroo et al., 2023; Mohammad Hashemi et al., 2023). This study bridges these traditions, showing how knowledge accuracy and confidence interact with risk perceptions and benefit evaluations to influence actual

purchase behavior. The result is a more holistic behavioral model that captures the complexity of sustainable food choices.

Fourth, the study enriches the literature on sustainable consumption by focusing on women, a demographic group that remains under-theorized despite their dominant role in household food purchasing (Chen, 2022; Xu, 2024). Women's biological vulnerabilities and caregiving responsibilities amplify their health beliefs, making them an ideal group for examining the knowledge–belief–behavior nexus. This gendered perspective highlights how theoretical models may operate differently across consumer groups, encouraging future research to adopt more nuanced demographic lenses.

Finally, by situating the research in China's rapidly expanding green food market, the study extends both KAB and HBM into a non-Western, policy-driven context. Much of the theoretical development of these models has occurred in Western settings, where consumer trust and certification systems differ significantly. The Chinese context, characterized by multiple certification levels, government-led campaigns, and consumer uncertainty, provides a unique test of these frameworks' cross-cultural robustness (Qi & Ploeger, 2021).

In sum, this study contributes theoretically by (1) refining the conceptualization of knowledge in KAB, (2) operationalizing "attitude" through HBM constructs, (3) integrating cognitive and affective pathways into a single explanatory model, (4) incorporating gendered consumer perspectives, and (5) extending Western-based theories into the Chinese food system context. These contributions not only strengthen academic understanding of green food consumption but also provide a foundation for future studies on knowledge structures, health beliefs, and sustainable behavior.

1.2.2 Practical Significance

This study also generates important practical implications for policymakers, industry stakeholders, and consumer education in China's evolving green food market.

First, the research offers guidance for public policy and consumer protection. By clarifying how subjective and objective knowledge shape women's green food consumption, findings help policymakers design targeted education campaigns to bridge the knowledge–behavior gap. For example, if women consumers show strong subjective knowledge but weak objective understanding, interventions should prioritize label literacy and certification clarity. Government agencies such as the China Green Food Development

Center can use these insights to strengthen certification communication, reduce consumer confusion, and build trust in official standards. This contributes directly to food safety policy and aligns with national goals of promoting sustainable diets and reducing foodborne health risks.

Second, the study provides valuable directions for marketing and business strategy. For green food enterprises, understanding the dual role of subjective and objective knowledge allows segmentation of female consumers into distinct profiles—for example, high-confidence but low-accuracy consumers versus cautious but knowledgeable consumers. Tailored marketing strategies can then be developed: simplified communication for the former, and deeper technical information for the latter. Businesses can also design branding strategies that highlight traceability, health benefits, and environmental performance in language that resonates with women's health beliefs (perceived benefits, barriers, susceptibility, severity). This improves competitive advantage in a crowded market where trust is often fragile.

Third, the study informs consumer education and community outreach. Women, as primary food decision-makers, transmit consumption norms to households. Educational programs—whether through schools, community health centers, or online campaigns—should therefore emphasize improving objective knowledge of certification systems, while also reinforcing women's confidence to act on their beliefs. This dual focus enhances both the accuracy and self-efficacy of consumer decisions, contributing to more consistent adoption of green food.

Fourth, the study highlights the role of digital platforms and e-commerce. As online grocery shopping expands in China, misinformation and unverified health claims proliferate. The study's findings suggest the need for stronger regulatory monitoring of online food claims and the development of consumer-friendly verification tools (e.g., QR-code traceability, digital certification apps). Collaborations between regulators, tech companies, and retailers could reduce risk perceptions and promote transparency in online green food markets.

Finally, the study supports women's empowerment and sustainable development goals (SDGs). By recognizing women as not only vulnerable consumers but also as active agents shaping household and community health, this study aligns with SDG 5 (Gender Equality) and SDG 12 (Responsible Consumption). Practical recommendations on how

women’s knowledge structures and health beliefs influence their choices can be translated into empowerment initiatives, enhancing their role as leaders in sustainable consumption transitions.

In sum, the study has four major practical contributions: (1) strengthening policy interventions for food safety and sustainability, (2) guiding marketing segmentation and branding strategies, (3) advancing consumer education to close the subjective–objective knowledge gap, and (4) empowering women as sustainable consumption leaders in China’s green food market. Together, these outcomes not only support healthier consumer behaviors but also contribute to the broader transformation of China’s food system toward safety, sustainability, and equity.

1.3 Statement of Research Questions

RQ1: How do subjective knowledge and objective knowledge influence Chinese women's green food consumption behavior?

RQ2: How do subjective knowledge and objective knowledge affect health beliefs (perceived benefits, perceived barriers, perceived susceptibility, perceived severity)?

RQ3: How do health beliefs (perceived benefits, perceived barriers, perceived susceptibility, perceived severity) and cues to action influence Chinese women's green food consumption behavior?

RQ4: How do demographic factors (marital status, education level, and average monthly income, age) affect Chinese women's green food consumption behavior?

1.4 Statement of Research Objectives

RO1:To investigate the impact of subjective knowledge and objective knowledge on Chinese women's green food consumption behavior.

RO2:To analyze the influence pathways of subjective knowledge and objective knowledge on health beliefs (perceived benefits, perceived barriers, perceived susceptibility, perceived severity).

RO3:To evaluate how health beliefs (perceived benefits, perceived barriers, perceived susceptibility, and perceived severity) and cues to action influence Chinese women’s green food consumption behavior, and to clarify the mediating roles of these belief-based mechanisms between knowledge and behavior.

RO4: To examine how demographic factors (marital status, education level, average monthly income, and age) shape Chinese women's green food consumption behavior.

1.5 Methodology

This study adopted a quantitative research approach to test an integrated theoretical model that combined the knowledge attitude behavior perspective with the health belief model in order to explain Chinese women's green food consumption behavior in Beijing. Under a positivist orientation, the model specifies subjective knowledge and objective knowledge as key cognitive antecedents, links them to health belief mechanisms including perceived benefits, perceived barriers, perceived susceptibility, and perceived severity, incorporates cues to action as an activating stimulus, and ultimately predicts green food consumption behavior as the focal outcome. Data were collected through a structured questionnaire survey using a non probability sampling strategy that combined purposive screening with quota based control. Considering the practical difficulty of constructing a complete sampling frame for Beijing women with prior green food purchasing experience, the study implemented field based recruitment and online administration to enhance coverage and feasibility. The formal survey was conducted from October to November 2025 in four common consumer settings in Beijing, including large chain supermarkets, community fresh markets, organic food specialty stores, and shopping mall food retail areas. Trained investigators approached potential respondents in high traffic locations, verified eligibility using brief screening questions, explained the research purpose and confidentiality principles, and invited qualified participants to complete the questionnaire voluntarily through the Wenjuanxing platform, with a small gift provided after completion to encourage participation. After data screening based on residency, age range, gender, and prior purchase experience, a total of 676 valid questionnaires were retained for subsequent analysis.

The questionnaire consisted of three parts. The first part presented survey instructions covering study purpose, completion guidance, and privacy assurance to support informed participation. The second part collected demographic information used as control variables, including age, average monthly income, education level, and marital status. The third part contained the main measurement section, covering subjective

knowledge, cues to action, perceived benefits, perceived barriers, perceived susceptibility, perceived severity, and green food consumption behavior, with most constructs measured using a seven-point Likert scale ranging from strong disagreement to strong agreement to improve measurement precision. Objective knowledge was measured using a factual scoring format in which correct responses were coded as 1 and incorrect or uncertain responses were coded as 0, producing an index score that reflects respondents' actual knowledge level. Prior to the formal survey, a pilot test was conducted to examine item clarity and preliminary psychometric performance, supporting minor wording refinement before large scale implementation.

In terms of data processing and statistical analysis, SPSS was used for descriptive profiling and preliminary data screening, while AMOS was applied for confirmatory factor analysis and structural equation modeling. The analysis followed a stepwise procedure: reliability and validity of the measurement model were first assessed through internal consistency and confirmatory factor analysis, after which the structural model was estimated to test the hypothesized direct effects. Mediation effects were examined using bootstrap procedures with bias corrected confidence intervals to evaluate the indirect pathways from knowledge to consumption behavior through each health belief mechanism. Control variables were incorporated to assess whether the model relationships remain stable net of demographic influences. Through this structured quantitative design, the study provides an empirically grounded test of how knowledge driven cognition and health related beliefs jointly shape green food consumption behavior among Beijing women.

1.6 Definitions of Terms

To ensure conceptual clarity and consistency between the introduction and the methodological design, this section defines the key constructs examined in the study. All definitions are theoretically grounded in prior literature and are aligned with the operational definitions and measurement scales presented in Chapter Three.

1.6.1 Green Food

Green food refers to agricultural or processed food products that comply with China's official green food standards and certification system. These products are produced under strictly controlled conditions, with limited use of synthetic pesticides and

chemical fertilizers, reduced environmental burden, and regular quality inspection, and can be identified by the official green food certification label on the package (Yang & Nakajima, 2025; Zhai et al., 2024). In line with this definition, respondents are asked about products that clearly carry the green food certification logo rather than broadly defined "healthy" or "organic" foods.

1.6.2 Subjective Knowledge of Green Food

Subjective knowledge of green food denotes consumers' perceived level of understanding regarding green food products. It reflects how much they believe they know about what green food is, how to judge its quality, and how confident they feel in their own expertise relative to other people without a professional background in food or nutrition (Fatha & Ayoubi, 2023). This definition follows consumer-knowledge research that conceptualizes subjective knowledge as self-assessed familiarity and expertise.

1.6.3 Objective Knowledge of Green Food

Objective knowledge of green food refers to the factual information that consumers actually possess about green food, including correct knowledge of production methods, environmental impacts, certification and management standards, and the presence or absence of components such as genetically modified ingredients. Consistent with Fatha and Ayoubi (2023), this construct is treated as accuracy-based knowledge and, in this study, is measured through true–false statements on green food regulations and attributes, with higher scores indicating greater objective knowledge.

1.6.4 Cues to Action

Cues to action are defined as external informational and social stimuli that trigger or strengthen consumers' motivation to purchase green food. Drawing on the health belief model literature (Abigail A Glick et al., 2024), cues to action in this study mainly refer to recommendations or reminders from experts (e.g., food specialists or nutritionists), family members and friends, and key opinion leaders or influencers on social media that direct attention to green food and encourage trial or repeated purchase.

1.6.5 Perceived Benefits

Perceived benefits describe consumers' beliefs about the positive outcomes associated with choosing green food. Adapting Martey (2024)'s work on organic food consumption, this construct encompasses the extent to which consumers believe that eating

green food is beneficial to their health, helps prevent diseases, supports good decision-making through credible labelling, and is an overall wise and valuable choice for themselves and their families. In the conceptual model, perceived benefits function as one dimension of health beliefs that mediates the effect of knowledge on behavior.

1.6.6 Perceived Barriers

Perceived barriers capture consumers' beliefs about psychological, practical, and cost-related obstacles that make it difficult to consume green food. Following Martey (2025), perceived barriers in this study include feelings of lacking control over what is eaten at home, uncertainty about appropriate quantities and types of healthy food, time constraints that hinder healthy eating, and difficulties choosing green food when dining or shopping with family and friends. Higher perceived barriers represent stronger perceived obstacles to adopting green food, and this construct is treated as a potential inhibitor within the health belief framework.

1.6.7 Perceived Susceptibility

Perceived susceptibility is defined as consumers' subjective assessment of how likely they are to experience negative health outcomes if they purchase or consume non-green food. Building on Wang et al. (2024), originally developed in the context of organic beef consumption, this construct reflects worries about contamination with harmful substances, such as pesticide residues, chemical additives, or other food safety problems that may threaten personal health. In the conceptual model, perceived susceptibility represents the risk-perception component of health beliefs.

1.6.8 Perceived Severity

Perceived severity refers to consumers' evaluation of how serious the consequences of foodborne diseases would be for their lives. Adapting the scale proposed by Wang et al. (2021), perceived severity in this study encompasses anticipated negative impacts of foodborne illness on one's physical health, emotional well-being, family life, and work performance. Together with perceived susceptibility, it captures the threat appraisal dimension of the health belief model.

1.6.9 Consumption Behavior toward Green Food

Green food consumption behavior among Chinese female consumers denotes the actual actions taken by women in Beijing aged 20–60 in purchasing, selecting, and recommending products carrying green food certification labels. In line with Zhu et al. (2013), this construct reflects the extent to which green food is regularly bought, actively sought out (e.g., looking for the green certification mark), tolerated even at higher prices, and promoted through word-of-mouth to relatives and friends.

1.7 Delimitation of the Study

This study explicitly delimits the generalizability of its findings in terms of geography, population, and observed variables. Geographically, the study is bounded to Beijing, China, where data were collected through a combination of offline survey channels within a defined fieldwork period in 2025. As Beijing is a highly urbanized first tier market with relatively developed green food availability, labeling exposure, and consumer purchasing power, the relationships identified in this study are most appropriately interpreted as reflecting an advanced urban consumption context. Generalizing the results to other regions, such as lower tier cities or rural areas, should be undertaken cautiously because market maturity, access to certified products, and consumer information environments may differ substantially.

In terms of the population, this study restricts the target respondents to women aged 20 to 60 who reside in Beijing and have prior experience purchasing green food. This delimitation is intentional, as the research design focuses on a consumer group that is both substantively relevant to household food decisions and sufficiently engaged with certified green food consumption to meaningfully evaluate knowledge and health belief mechanisms. Participants who did not meet these inclusion criteria were excluded during survey screening, which means the results are not intended to represent male consumers, younger adolescents, older adults beyond the specified age range, or individuals without relevant purchasing experience. In addition, the study combines purposive recruitment with quota sampling based on the age distribution of Beijing women, which strengthens comparability across age strata within the defined population but still limits the extent to which the sample can be treated as a random draw from all eligible consumers.

The study also delimits the research object and conceptual scope. “Green food” is defined narrowly as food products that carry China’s official green food certification label. Therefore, the conclusions speak to consumer perceptions and behaviors associated with this specific certification regime and should not be directly extended to broader categories such as organic food, general healthy food, or other environmentally positioned foods that do not fall under the same labeling and certification system.

Finally, the study is delimited by the observed variables included in the proposed model. The explanatory focus is confined to the effects of subjective knowledge and objective knowledge on green food consumption behavior through the mediating structure of health belief components, namely perceived benefits, perceived barriers, perceived susceptibility, and perceived severity, as well as cues to action. Demographic characteristics such as age, income, education level, and marital status are incorporated as controls to reduce confounding, but the study does not attempt to model the full set of factors that may shape sustainable food consumption. Supply side conditions, detailed certification governance performance, firm level marketing strategies, and wider sociocultural or policy determinants are outside the scope of this work. Consequently, the findings should be interpreted as evidence for a knowledge and health belief based mechanism of certified green food consumption within the defined Beijing female consumer population, rather than as a comprehensive explanation of sustainable food purchasing across all contexts and groups.

1.8 Outline of the Study

This study is organized into five chapters. Chapter One introduces the research background and problem context, clarifies the significance of examining green food consumption in contemporary China, and specifies the research questions, objectives, and overall scope of the study. It also provides key concept definitions and positions the study within its intended population and research boundaries, thereby establishing a clear foundation for the subsequent theoretical and empirical chapters.

Chapter Two reviews the core literature related to green food consumption, consumer knowledge, and health belief based decision making. Building on this review, the chapter explains the theoretical foundations adopted in this study, with particular emphasis on the Knowledge–Attitude–Behavior perspective and the Health Belief Model.

It then defines the main constructs, develops the conceptual framework, and formulates the full set of hypotheses that guide the empirical testing.

Chapter Three describes the research methodology in detail. It presents the research design, the target population and sampling strategy, and the procedures for questionnaire development and data collection. The chapter also explains the measurement of each variable, the structure of the survey instrument, and the analytical techniques applied to assess data quality, reliability and validity, and to prepare the dataset for model estimation.

Chapter Four reports the empirical results. It first summarizes the sample profile and descriptive statistics, followed by the measurement model assessment to confirm reliability and validity. The chapter then presents the structural equation modeling results, including hypothesis testing and the interpretation of direct and indirect relationships among subjective knowledge, objective knowledge, health belief dimensions, cues to action, and green food consumption behavior.

Chapter Five discusses the findings in relation to existing studies and highlights what the results contribute to the understanding of certified green food consumption. It summarizes the theoretical implications derived from the integrated knowledge and health belief perspective, outlines practical implications for consumers, marketers, and relevant stakeholders, and acknowledges the study's limitations. The study concludes by offering directions for future research that may extend the model to other regions, populations, or complementary explanatory factors.

1.9 Conclusion

This chapter outlines the research background, practical significance, research questions, and objectives of the study. It clarifies the scope and central themes, laying a solid foundation for subsequent theoretical and empirical analysis. Given the increasing importance of sustainability and health in consumer food choices, it is crucial to understand the cognitive and motivational mechanisms behind green food consumption. Particular attention is directed toward Chinese women as a key consumer group in this context. By analyzing the complexity of their green food consumption behavior—shaped by both knowledge structure and health-related beliefs—it establishes clear objectives for the research direction. More importantly, this study demonstrates distinct theoretical originality and conceptual innovation. It breaks through the limitations of existing green

food consumption research, which often relies on a single theoretical application. By innovatively integrating the KAB and HBM models, it clarifies the core contradiction of the misalignment between objective and subjective knowledge, and constructs a complete transmission framework of 'Knowledge-Health Beliefs-Behavior'. This addresses the gaps in existing research, such as insufficient theoretical integration, vague cognitive dimension division, and weak variable logic, achieving a dual breakthrough in theoretical perspective and research approach. As the research progresses, subsequent chapters will elaborate in detail on the conceptual framework, variable relationships, and analytical strategies used to explore this topic in depth.

CHAPTER 2
LITERATURE REVIEW

This chapter, based on the research background, reviews the relevant theoretical foundations of the study, laying the groundwork for the construction of the conceptual model and hypotheses. It primarily discusses knowledge attitude behavior (KAB) model and health belief model (HBM). In addition, it examines prior research on Chinese women's green food consumption, focusing on behavioral mechanisms, influencing factors, and explanatory frameworks. These studies provide essential references for identifying key variables and developing the measurement model and hypotheses for this research.

2.1 Contexts of the Study

2.1.1 Green Food vs Conventional Food

Green food has different names in different countries, such as “organic food” and “ecological food”. In China, green food is a unique designation. Green food is an ecological certification program initiated by China's Ministry of Agriculture and Rural Affairs in 1990 (Huang et al., 2024). Its purpose is to provide safe, pollution-free, high-quality edible agricultural and processed products. Green food refers to agricultural products grown, produced, or processed under environmentally friendly conditions, where the levels of toxic and harmful substances are strictly regulated to ensure compliance with national food safety standards (Lu et al., 2022). The green food logo serves as an official product quality certification, registered by the Green Food Development Center of China with the Trademark Office of the State Administration for Industry and Commerce. It represents a unique labeling system in China, Figure 2.1 shows the logos of the green food label and the organic food label. Green labeling plays a significant role in reassuring consumers about the safety and quality of green food products (Xu et al., 2024). Consumers generally perceive green-labeled foods to be more environmentally friendly, healthier, and safer compared to conventional alternatives (Yuan et al., 2024). In the

Chinese context, green food labels are particularly favored due to growing concerns regarding personal health and environmental sustainability (Sun et al., 2024).

Conventional food, in contrast, refers to agricultural products produced using standard or traditional farming practices that do not require specific environmental or ecological certifications (Wang, 2023). These products are typically cultivated with the aid of synthetic fertilizers, pesticides, herbicides, and other agrochemicals to maximize productivity and reduce costs. While conventional foods are subject to national food safety regulations, they generally lack the stringent restrictions on chemical residues or environmental impact found in green or organic food systems. As a result, they may raise consumer concerns regarding long-term health effects and ecological sustainability.

In response to these concerns, green food—characterized by strict quality control, traceability, and reduced chemical inputs—has gained prominence as a preventive health measure (Yu et al., 2022). Green food, through its eco-friendly and health-focused production methods, offers specific protective mechanisms against foodborne diseases. At the production stage, green food limits the use of pesticides and chemical fertilizers, instead prioritizing ecological farming methods such as biological pest control and crop rotation (Ullah et al., 2025). During processing, stringent hygiene standards ensure that pathogens are minimized through disinfection, environmental cleanliness, and standardized operational procedures (Chandimali et al., 2025). Furthermore, the rigorous testing for heavy metals, microorganisms, and additives ensures that only safe and high-quality products reach the market (Ansari et al., 2024).



a b

Figure 2.1 Logos of Green Food Label and Organic Food Label

Source: Green Food Development Center

Figure 2.1(a) shows the green label for agri-product; and (b) shows the organic label in China. Compared with the unified international standards for organic food, China's food certification system is more layered and complex, involving different certification grades and labels. As shown in Figure 2.2, China's green food is classified into two levels: Grade AA and Grade A. Grade AA green food adheres to the highest standards, similar to organic food, prohibiting the use of pesticides, chemical fertilizers, and other chemical inputs to ensure purity and eco-friendliness. However, due to its similarity with organic certification standards, Grade AA certification was suspended by the China Green Food Development Center in 2008. Current certifications mainly focus on Grade A green food. Grade A green food serves as a "middle way" between organic and conventional food. It allows limited use of chemical fertilizers and pesticides but imposes strict restrictions on their amount and application methods. This approach avoids a complete ban on chemical inputs while reducing environmental pollution and ensuring food safety.

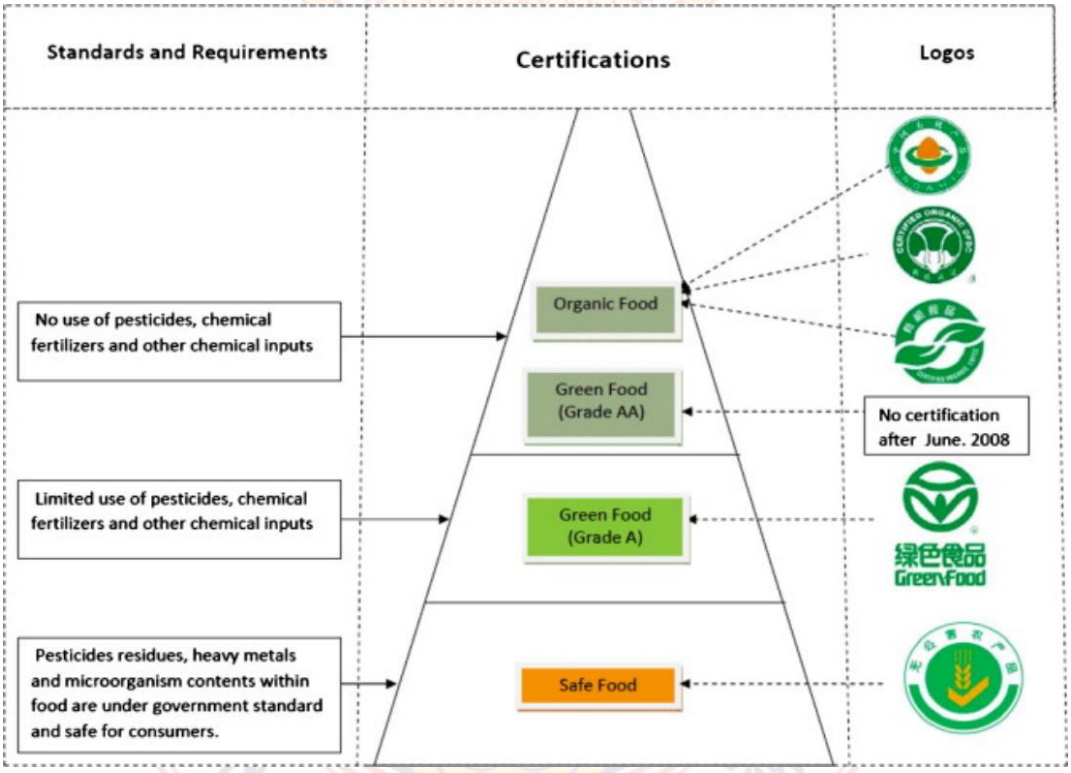

Figure 2.2 Definition and Labels of the Chinese Food Certification System
Source: Yu et al. (2014)

Figure 2.2 illustrates the different certification levels and their corresponding labels in the Chinese food certification system, including organic food, green food (Grade AA and Grade A), and safe food.

To promote the healthy development of the green food industry, the Chinese government has introduced multiple policies, such as the Ministry of Agriculture and Rural Affairs' Opinions on Promoting High-Quality Development of Green Food. These policies cover aspects ranging from production standards, processing procedures, to certification management, providing a solid institutional guarantee for the green food supply chain. Their implementation has improved production standardization, market trust, and industry growth. Table 2.1 summarizes major policies related to green food development in recent years:

Table 2.1 Policies for Promoting Green Food Development in China

Date	Department	Policy Title	Key Content
2022	CGFDC	14th Five-Year Plan Outline for Green Food Industry Development	Strengthening institutional and policy support for green food development.
2022	Ministry of Agriculture	Guidelines for Promoting Ecological Farm Construction	Promoting low-carbon production and green ecological branding.
2023	Central Government	National Quality Strengthening Plan	Promoting green food certification and standardization across the supply chain.
2024	CGFDC	2024 Green Food Work Plan	Focusing on enhancing supply, ensuring quality, and building strong branding.

Table 2.1 summarizes the major policies implemented by the Chinese government since 2020 to support green food development. The policies cover areas such as production standards, quality control, brand building, and cold chain logistics support.

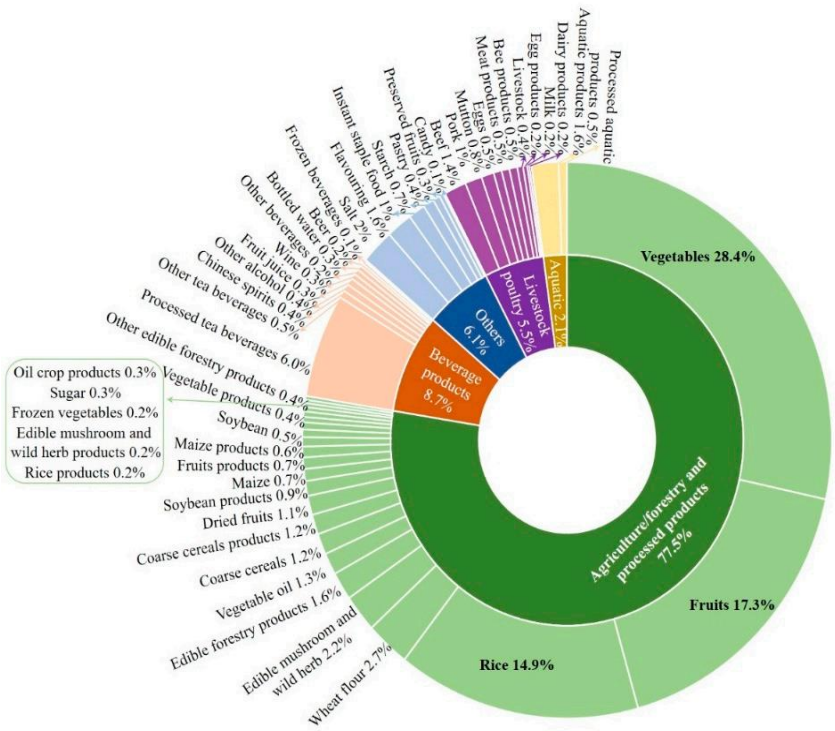

Figure 2.3 Category Distribution of Green Food in China

Source: Xu et al. (2020)

Figure 2.3 shows the distribution of green food categories in China, with agricultural and forestry products making up 77.5%.



Corn Sunflower oil Rice

Figure 2.4 Examples of Green Food Products

Source: https://www.taobao.com/ ,2025

Figure 2.4 shows examples of green food products available on Taobao, including corn, sunflower oil, and rice.

Amid rapid growth in green food consumption, China's production and certification system has also matured. As of September 2024, the number of green food

enterprises in China reached 31,937, with over 67,807 certified products. Annual output has increased from 106 million tons to 156 million tons (Green Food Development Center, 2024). Green food now spans crops, livestock, and aquaculture, forming a multi-level supply chain with rigorous quality standards, maintaining an inspection pass rate above 98% (Qi & Ploeger, 2021).



Figure 2.5 Growth Trends of Green Food Enterprises, Products, and Annual Production in China (2019–2024)

Source: Green Food Development Center in 2020–2024, 2025

Figure 2.5 illustrates the number of green food enterprises, product varieties, and annual production (in 10,000 tons) in China from 2020 to 2024, showing steady growth in all three indicators.

Green food brands have established a strong market image and gained a broad consumer base. In 2024, the annual sales revenue of green food in China reached 609.78 billion RMB, and exports exceeded 3.16 billion USD. This trend indicates that green food has moved from a niche market to mainstream consumption, becoming an essential part of the food industry. With rising awareness of health and environmental protection, demand for green food continues to grow, especially in first-tier cities.

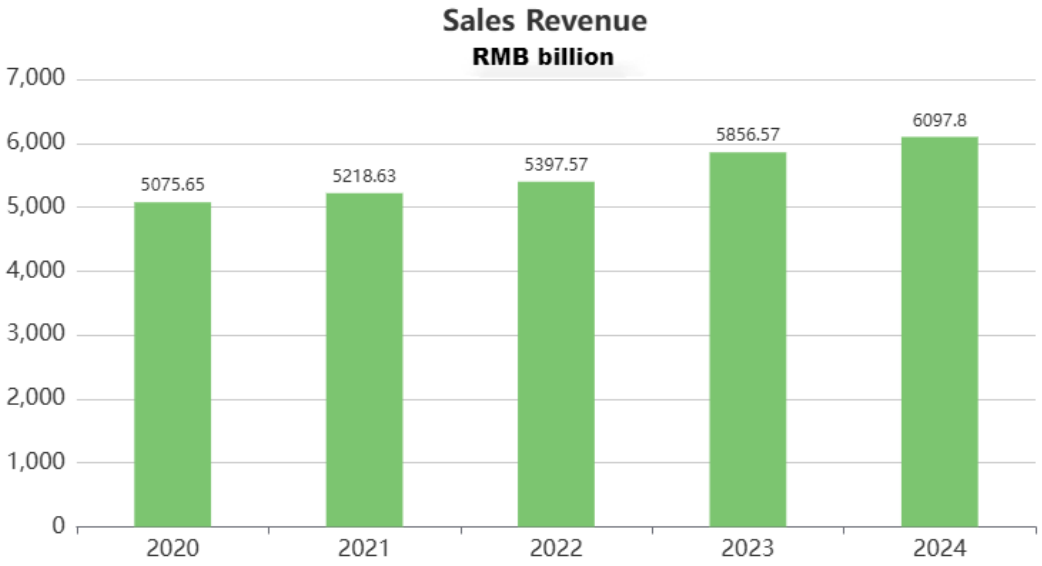

Figure 2.6 Sales Revenue of Green Food in China Consumption(2020–2024)

Source: Green Food Development Center in 2020–2024, 2025

Figure 2.6 shows the annual sales revenue of green food in China from 2019 to 2024 (in RMB billion), reflecting a steady upward trend over the years.

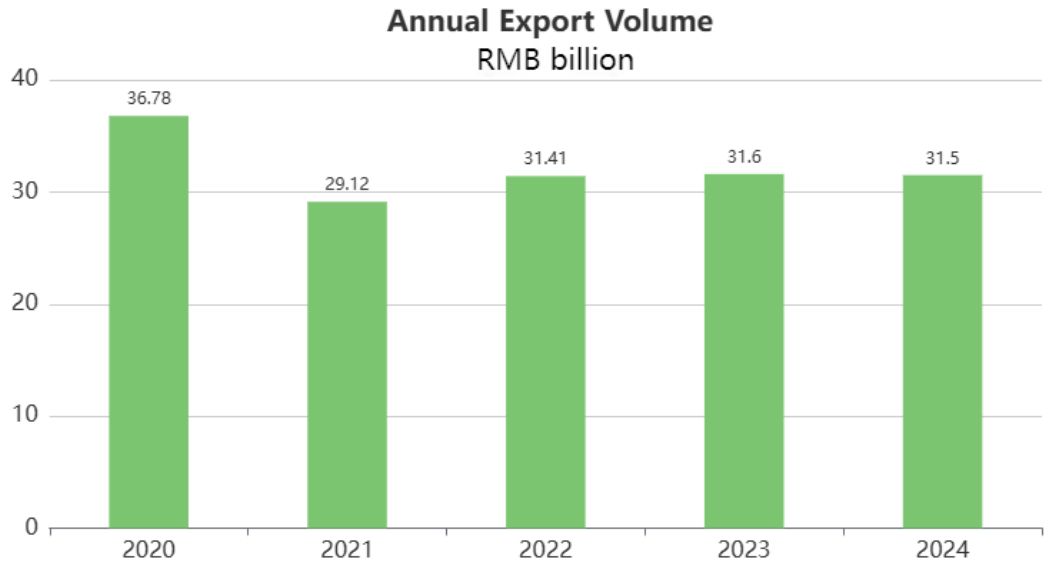

Figure 2.7 Export Volume of Green Food in China Consumption(2020–2024)

Source: Green Food Development Center in 2020–2024, 2025

Figure 2.7 illustrates the annual export volume of green food from China between 2019 and 2023 (in USD billion), showing fluctuations over the years.

2.1.2 Chinese Female Consumers and Purchasing Behavior of Food

With the improvement of economic conditions and the enhancement of self-awareness, modern women have an increasing demand for better quality of life and have become the main force in consumption in the new era (Guo & Zhu, 2023). Women consumers are predominantly found in first-tier cities such as Beijing, Shanghai, Shenzhen, and Guangzhou. This is because Beijing has the highest number of middle-class families, followed by Shanghai. Meanwhile, Guangdong province has the largest number of middle-class families. Given the vast size and potential of China's female consumer market, it is imperative to conduct research specifically targeting this consumer group. The 2020 China Population Census data shows that the total female population in China was 688 million, with 432.9 million women aged 15–59, accounting for 62.9% of the female population (National Bureau of Statistics of China, 2021). There are nearly 400 million female consumers aged 20 to 60 in China. The size of China's female consumer market has reached 10 trillion USD, which is nearly equivalent to the combined retail markets of Germany, France, and the United Kingdom (Chen, 2022). Moreover, by 2025, China's female consumer market is projected to exceed 15 trillion USD, highlighting women's dominant position in shaping the future of consumption across multiple sectors (WWD China, 2024).

Among various consumption categories, food has emerged as a core area of concern for female consumers. With the growing awareness of health and the rising popularity of preventive nutrition, women's food consumption behavior increasingly reflects values such as safety, wellness, and sustainability. The 2024 FDL Digital Food View report projects that the Chinese health food market will exceed RMB 300 billion by 2025, with urban women identified as the most active contributors to this growth. Labels such as "organic," "low sugar," "zero additives," and "high protein" are now key decision-making indicators. Furthermore, Jiemian News (2024) notes a notable cultural shift in which female consumers are evolving from traditional family-centered caregivers to empowered individuals who prioritize their own physical and emotional health. This transformation—characterized by a pursuit of "self-centered wellness"—has made women the primary driving force behind the expansion of the green, organic, and functional food sectors. This heightened attention to food—especially health-oriented and sustainable choices—calls for a deeper understanding of the psychological motivations behind

women's consumption behavior (Ejiohuo et al., 2024). As women become more concerned about food safety and long-term well-being, their purchasing decisions are often influenced not only by external factors (e.g., product labeling, pricing) but also by internalized health beliefs and personal risk assessments (Preeti Dhuria et al., 2021).

This heightened concern for food safety is particularly justified given that foodborne diseases have become an increasingly critical public health concern globally, with the World Health Organization estimating that foodborne diseases cause approximately 600 million illnesses and 420,000 deaths annually worldwide (Keddy et al., 2025). The combined health burden is estimated at around 33 million disability-adjusted life years lost per year—comparable to the global burden of major infectious diseases such as HIV/AIDS, malaria, or tuberculosis (Grace, 2023; Keddy et al., 2025). In developing countries, including China, foodborne diseases present significant risks (Hashemi et al., 2023). Contaminated food products, linked to pesticide residues, heavy metals, artificial additives, and pathogenic microorganisms, can cause serious health consequences such as gastrointestinal disorders, reproductive health issues, and long-term chronic diseases (Onyeaka et al., 2024).

Women are particularly vulnerable to foodborne illnesses for several specific reasons. First, as the primary food preparers in most households, women handle raw ingredients, cook meals, and manage food storage more frequently than men, which increases their direct exposure to potential foodborne pathogens (Saeed et al., 2021). Second, pregnant and lactating women face heightened biological risks, as their altered immune systems make them more susceptible to foodborne infections, and certain pathogens can cause fetal abnormalities, miscarriage, or be transmitted through breast milk to newborns (Mafe & Büsselberg, 2024). Third, women typically bear the responsibility for family members' dietary health and safety, creating additional psychological pressure as they must make food choices that protect not only themselves but also their children and elderly family members (Migheli, 2021). This combination of increased physical exposure, biological vulnerability, and caregiving responsibility makes women both more likely to contract foodborne diseases and more motivated to seek preventive solutions.

In response to these risks, green food, which is characterized by stringent quality control, traceability, and reduced chemical inputs, has increasingly been viewed as a preventive health measure (El Ayoubi & Radmehr, 2023). Green food offers specific

protective mechanisms against foodborne diseases through multiple pathways. Green food ensures safety by limiting pesticide and fertilizer use, following strict hygiene standards during processing, and conducting comprehensive testing, while also using safe packaging and transportation methods to prevent contamination (Hamilton et al., 2023). Female consumers represent the most active and influential group in the green food market, serving as the primary decision-makers in household food purchasing and playing a pivotal role in shaping family consumption patterns (Tepavčević et al., 2025). As women become more concerned about food safety and long-term well-being, their purchasing decisions are often influenced not only by external factors such as product labeling and pricing, but also by internalized health beliefs and personal risk assessments (İnan & Konyalı, 2025). Women consumers place a high value on health and food safety, which contributes to their strong preference for green and organic products (Karthika & Senthilkumar, 2021). This heightened concern for environmental and food safety issues is often rooted in the perceived connection between environmental quality and both family and personal health (Saeed, 2021). Many women demonstrate nurturing attitudes not only toward their children and family members but also toward their own well-being, making green food consumption particularly appealing as a proactive strategy to minimize exposure to harmful substances and reduce disease risk for themselves and their families.

Women's green consumption behavior may be driven by multiple motivations—some prioritize family care, while others focus on improving their own lifestyle and health (Lee & Haley, 2022; Szaban et al., 2024). Although gender may not significantly moderate the relationship between subjective norms, perceived behavioral control, and purchase intention, it remains a crucial factor influencing attitudes and behaviors toward sustainable food consumption (Doan et al., 2025). Despite the immense potential of female consumers in the green food market, increasing the frequency of women's green consumption requires more than awareness. Emphasizing the health and environmental benefits of green products, for both family and individual well-being, and improving women's knowledge base are two indispensable strategies (Zhang et al., 2025). The health belief model (HBM), originally developed to explain preventive health behaviors in response to disease threats, offers a suitable framework to understand women's shift toward safer food choices. Specifically, women's greater awareness of foodborne disease risks fits the HBM's core idea that health behaviors come from risk perception and belief in preventive measures'

effectiveness. These psychological mechanisms, informed by women's risk perception and health motivation, significantly influence their attitudes toward food labeling, certification, and green food preferences. Understanding how these health beliefs translate into actual purchasing behaviors requires examining the specific characteristics and motivations of different female consumer segments.

Overall, Chinese women have contributed significant opportunities for the development of the green food market. Thus, this study focuses on the green food consumption behaviors of Chinese women, employing the health belief model (HBM) as the theoretical framework. By examining knowledge and health beliefs—two indispensable factors within the HBM framework for understanding green food consumption—this study can help enterprises and policymakers more accurately understand the behavioral patterns of this consumer group, thereby formulating effective strategies to promote the growth of green food consumption and advance the sustained development of the market.

2.1.3 Related Researches on Factors Affecting Green Food Consumption

The rapid development of green food has prompted scholars to further investigate the driving factors and barriers to green food consumption (Zheng et al., 2023). Motivations behind green food consumption are multidimensional and complex. Health consciousness and food safety are the main driving forces, especially in China, where frequent food safety incidents have led consumers to prefer food that is pollution-free and free of pesticide residues (Wang et al., 2022). Meanwhile, environmental awareness is gradually becoming an important influencing factor as well (Li & Shan, 2025). With the intensification of global climate change and environmental issues, consumers are paying more attention to the environmental impacts of the food they purchase (Predieri et al., 2023). In addition, moral norms, health consciousness, and perceived behavioral control significantly influence purchase intention (Qi & Ploeger, 2021). Income level and educational background also have a significant impact on green food consumption: consumers with higher incomes and higher education levels are more knowledgeable about green food and better able to afford its relatively higher prices, resulting in stronger purchase intentions (Liang et al., 2024).

In green food consumption, the gap between attitude and behavior is also a critical issue that hinders the transformation from consumer cognition to actual purchasing

behavior (Wu et al., 2021). Although many consumers express a positive attitude toward green food—particularly regarding health, safety, and environmental protection—their purchasing behavior does not fully reflect this (Xu et al., 2024; Zhuo et al., 2022). The high price of green food is one of the key factors that hinder consumers' purchase intention. Green food prices are usually higher than those of conventional food, especially in low-income groups; the premium price makes it difficult for consumers to afford, even if they recognize the health and environmental benefits of green food. This, to some extent, limits further market expansion (Smoluk-Sikorska et al., 2023). Consumers' lack of awareness of green food is also a significant barrier to actual purchasing behavior. Many consumers lack understanding of the green food certification system and its benefits, causing them to hesitate when making purchases (Eunike et al., 2025). Frequent food safety incidents have weakened consumers' trust in green food certification labels, further increasing the uncertainty in their purchasing decisions (Wu et al., 2021). Consumers' perceived risk of green food also has an inhibitory effect on purchase decisions. Many consumers have doubts about the quality and reliability of green food certification, believing that there may be risks involved in purchasing green food. This perceived risk heightens consumers' concerns, making them more inclined to choose conventional foods, thereby affecting the market penetration rate of green food (Bravo et al., 2024; Xu et al., 2024). These barriers limit further expansion of green food in the market, and although there is a relatively high level of acceptance among certain groups, achieving widespread adoption still faces challenges.

Although existing studies have delved deeply into the driving factors and barriers of green food consumption, including the impacts of health awareness, environmental consciousness, and perceived accessibility on purchase intention, there is still a scarcity of research on how knowledge, especially specific types of knowledge, influences green food consumption behavior (Castro Campos & Qi, 2024). One possible reason is the relatively recent development of China's organic and green food certification system, which began formalizing only in the 1990s and has undergone continuous adjustments in recent years. These adjustments, along with the involvement of multiple certification bodies and agencies, may have led to consumer confusion. The current literature focuses more on consumers' lack of cognition and its obstacles to purchasing behavior, but systematic analyses of the mechanisms through which specific types of knowledge play a role in green

food consumption remain insufficient (van der Merwe et al., 2024). Therefore, this study aims to fill this gap by exploring the pathways through which specific knowledge affects green food consumption, thereby providing new perspectives and scientific evidence for both theoretical research and practical application.

2.1.4 Knowledge of Food

Knowledge, defined as the facts, skills, and understanding individuals acquire through learning, experience, and information, plays a fundamental role in the field of food consumption (Guiné et al., 2023). This knowledge system encompasses consumers' understanding of food ingredients, nutritional properties, production processes, and safety standards, providing essential informational support for rational decision-making in a complex market environment (Tan et al., 2022). Specifically, sufficient food-related knowledge enables consumers to accurately assess product value, discern the credibility of marketing messages, and ultimately make purchasing choices that align with their health needs (Nazzaro et al., 2025). The knowledge base not only influences individual consumer behavior but also helps shape the broader dynamics of market supply and demand. Consumer food-related knowledge can be classified into several categories, each of which plays a unique role in shaping dietary choices and behaviors. Table 2.2 summarizes and outlines the classification and key characteristics of consumer food-related knowledge.

Table 2.2 Categories of Consumer Knowledge in Food Consumption

Author	Type of Knowledge	Definition/Scope	Key Findings	Impact/Role
Talwar et al. (2021)	Nutrition knowledge	Consumers' understanding of food nutrients and their health effects.	Consumers with adequate nutrition knowledge tend to choose healthier foods such as organic and functional products.	Enhances health awareness, improves dietary habits, and helps prevent chronic diseases.

Table 2.2 (continued)

Author	Type of Knowledge	Definition/Scope	Key Findings	Impact/Role
Bolek (2020)	Food safety knowledge	Involves awareness of potential food risks, proper storage, and handling methods.	Improves understanding of food labels, increases acceptance of new technologies (e.g., food preservation), and reduces health risks.	Promotes rational judgment, safer food choices and storage practices, and helps prevent foodborne illnesses.
Rusyani et al. (2021)	Environmental and sustainability knowledge	Consumers' awareness of the environmental impact of food production and consumption.	Raises ecological responsibility and motivates choices such as reducing plastic packaging or opting for locally sourced food.	Promotes green consumption and raises sustainability awareness.
Nurhayati and Hendar (2020)	Cultural and religious knowledge	Pertains to food choice standards and values shaped by specific cultural or religious contexts.	Increases trust and purchase intentions among Muslim consumers regarding halal food, aligning choices with cultural and religious values.	Strengthens cultural identity and compliance, integrates cultural/religious values into food choices.
Roh et al. (2022)	Health knowledge	Consumers' awareness of their health needs and how to meet them.	Health consciousness drives choices of healthier foods, such as low-fat, high-fiber, or vitamin-rich options.	Reduces health risks, increases the selection of health foods, and improves diet quality.

Table 2.2 summarizes the main categories of consumer knowledge related to food consumption, including nutrition knowledge, food safety knowledge, environmental and sustainability knowledge, cultural and religious knowledge, and health knowledge. It highlights their definitions and key roles in influencing consumer behavior.

Against the backdrop of increasing global concern for health, sustainability, and food safety, food-related knowledge has become an indispensable tool for consumers making informed decisions (Van Bussel et al., 2022). In the field of sustainable food consumption, consumers who are more knowledgeable about the benefits of sustainable food tend to show stronger purchase intention and more positive attitude (Shan et al., 2025). In the context of purchasing green or organic food, knowledge related to product safety, production methods, and eco-label certifications significantly influences consumer trust and decision-making (Agarwal et al., 2025).

Nutrition knowledge helps consumers understand the role of such foods in boosting immunity and preventing chronic diseases, thereby enhancing preferences for healthy foods (Talwar et al., 2021). Food safety knowledge enables consumers to interpret labels and production standards more effectively, strengthening trust in green food's chemical-free and high-quality characteristics (Roy et al., 2023). Environmental and sustainability knowledge increases ecological responsibility, encouraging choices such as locally produced goods or biodegradable packaging that support sustainable development (Rusyani et al., 2021).

Green and organic foods, known for their natural, healthy, and eco-friendly attributes, have gained widespread attention among consumers (Xu et al., 2021). However, despite growing research on the influence of food safety and environmental knowledge on consumption behaviors, there remains a lack of in-depth study on how knowledge of green foods specifically influences health beliefs and purchasing behaviors. Knowledge may not only shape consumers' beliefs about the health benefits of green foods but also drive purchasing behavior and habitual consumption. Yet, the specific mechanisms through which knowledge functions in green food consumption are still underexplored. Therefore, this study focuses on green food knowledge and investigates its influence on health beliefs and green food consumption behaviors, aiming to fill this research gap and provide a scientific foundation for green food promotion and consumer education initiatives.

2.2 Parent Disciplines

2.2.1 Health Belief Model

Health Belief Model (HBM) was originally developed in the 1950s by social psychologists in the U.S. Public Health Service, including Hochbaum, Leventhal, Kegeles, and Rosenstock, and was first comprehensively presented by Rosenstock (1966). The model was created to explain why individuals adopt preventive health behaviors in the absence of symptoms, addressing a critical gap in understanding health decision-making processes (Rosenstock, 1966). The theoretical model is shown in Figure 2.8 , which clearly demonstrates the logical relationships among variables.

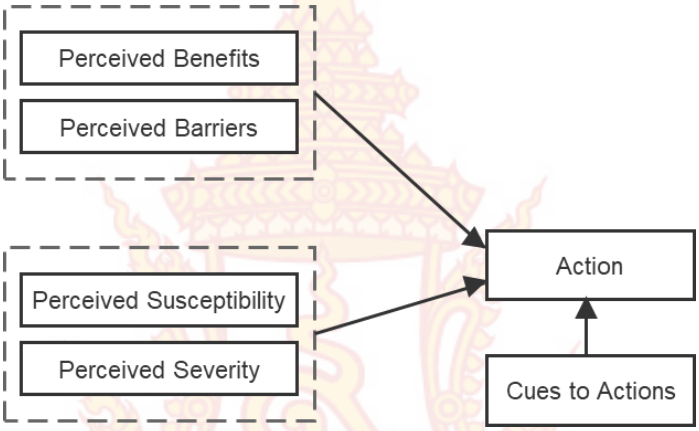

Figure 2.8 Health Belief Model (HBM)
Source: Rosenstock (1966)

In 1974, Health Education Monographs dedicated an entire special issue to the Health Belief Model, which included seminal papers by Becker (1974). This publication played a pivotal role in establishing the model's academic legitimacy and facilitating its widespread adoption in health behavior research. Since then, HBM has evolved into one of the most widely used theoretical frameworks for understanding and predicting health-related behaviors, particularly those aimed at preventing health risks or promoting healthy lifestyles.

Health belief model centers on two main concepts which are perceived threat and behavioral evaluation (Rosenstock, 1974). Perceived threat is further divided into perceived susceptibility and perceived severity. Perceived susceptibility refers to an individual’s subjective assessment of the likelihood of a specific health threat, and perceived severity refers to the perceived seriousness of the negative consequences arising

from the threat. The evaluation of behavior includes perceived benefits, which refer to the positive results an individual expects to obtain from performing a health behavior, and perceived barriers, which denote the difficulties or costs that may be faced during the execution of such behavior. Subsequently, some scholars have expanded the basic model by introducing two additional cognitive or motivational constructs to enhance its explanatory power: self-efficacy and cues to action (Janz & Becker, 1984; Rosenstock et al., 1988). Self-efficacy reflects one's confidence in the feasibility of performing a health behavior, while cues to action refer to specific triggers or information that prompt action .Building on this foundation, health literacy as a key factor in the adoption of healthy behaviors (Zhang et al., 2022). By integrating the health belief model with the health literacy skills framework, knowledge, which is a foundational element of health literacy, researchers have proposed a more comprehensive model in which health literacy exerts an indirect influence on health behavior through its impact on core health belief constructs.

Originally, the HBM was mainly applied to research on preventive health behaviors (Rosenstock, 1974). As the theory evolved, its scope expanded to include health-promoting behaviors (like healthy eating and physical activity) and even environmental behavior research (Kisda et al., 2024; Riazi et al., 2024; Turner & Reed, 2023). Accordingly, it has become a key theoretical tool for predicting health-related decision-making. Although the Health Belief Model (HBM) is not a specialized consumer behavior model, its core focus on preventing health threats makes it particularly relevant for understanding food consumption behaviors arising from food safety concerns. The model's explanatory power for dietary behaviors was established early in its development, with research indicating that when individuals perceive health threats in their current food consumption patterns, their health beliefs can significantly predict dietary compliance behaviors (Becker et al., 1977).

Contemporary food safety issues encompass various threats including harmful substances contamination, chemical residues from pesticides and additives, and pathogenic microorganisms that can cause foodborne diseases (Grace, 2023). These food safety threats create the risk perception context that drives consumers toward protective food choices, paralleling the health threat scenarios that HBM was originally designed to address. In response to foodborne disease risks, green food consumption has emerged as a preventive health behavior (Tan et al., 2022). Green food, characterized by stringent

quality control, reduced chemical inputs, and comprehensive safety testing, represents a proactive approach to minimizing exposure to foodborne disease risks (Krishnan & Devarajan, 2025). This preventive orientation aligns with HBM's original purpose of explaining why individuals adopt protective behaviors to prevent disease occurrence (Martey, 2024).

In food consumption research, HBM has proven to be highly explanatory. Studies have found that perceived health risks significantly influence consumers' intentions to purchase weight-loss foods (de Mello Marsola et al., 2025; Zhang et al., 2023), while perceived benefits, cues to action, and self-efficacy are key predictors of willingness to consume local foods (Jung et al., 2023).Recent studies have also integrated HBM with the Value-Belief-Norm Theory to analyze consumer acceptance of innovative foods, such as 3D bioprinted meat (Mendoza et al., 2024), further confirming the adaptability and predictive power of HBM in the food consumption field. Some studies suggest that health beliefs shape consumer attitudes toward organic food and influence willingness to pay a premium (Andika & Setyanta, 2024). However, other research proposes a simplified framework in which health belief constructs directly predict behavioral intention without requiring attitudinal mediation—an approach particularly relevant when health motivation stems from risk perception and practical concerns (Nam & Pak, 2023). Both perceived health risks and perceived barriers jointly influence functional food consumption among the elderly (Tarleton et al., 2026).

For women consumer group, the use of HBM becomes particularly meaningful due to their distinctive characteristics. Women assume primary responsibility for family health management, exhibit heightened sensitivity to food safety risks, and need to balance health protection with practical constraints across multiple roles (Chance & Abdoul, 2025; Garsow et al., 2022). As the dominant decision-makers in household food purchasing, women's health beliefs influence not only their personal choices but also directly affect the health and well-being of family members, a responsibility that leads to more complex risk assessment and behavioral decision-making processes when confronting food safety threats (Dhuria et al., 2021). Additionally, women's green food consumption often involves weighing health benefits against economic costs, convenience, family acceptance, and other multiple factors - this multidimensional decision-making consideration aligns well with the core logic of risk perception and behavioral evaluation

in the HBM framework. Therefore, applying HBM to analyze Chinese women's green food consumption behaviors can better reveal how their health beliefs translate into actual consumption decisions within complex sociocultural environments.

2.2.2 Knowledge-Attitude-Behavior Model

Knowledge-attitude-behavior (KAB), also found in literature as knowledge-attitude-practice (KAP), is an important theoretical model of health education, which asserts that behavior change is affected by knowledge and attitude (Guillari et al., 2024).The knowledge, attitude, and behavior (KAB) model,is one of the key theoretical frameworks in behavioral research (Pisano & Lubell, 2017). The model was first proposed in the 1960s by British health education expert Cust and Mayo , aiming to explain how individual knowledge and beliefs influence changes in health behaviors (Xie et al., 2024). Specifically, further defined the key components of the KAB model as follows:

Knowledge refers to the understanding of a specific subject,

Attitude refers to emotional tendencies and predispositions toward the subject.

Behavior is the manner in which knowledge and attitudes are exhibited through actions (Verplanken & Orbell, 2022). Its core assumption is that knowledge shapes the formation of attitudes, and both knowledge and attitudes together determine the emergence of behaviors.

In addition to the classic KAB theoretical model, scholars have proposed improved versions of the KAB theoretical model (Geiger et al., 2019; Pisano & Lubell, 2017). The enhanced KAB theoretical model strengthens the influence of knowledge on behavior, enabling individuals to rationally reflect on their actions through knowledge transfer and subsequently take conscious actions (Baser et al., 2017; Sanlier & Baser, 2020). As illustrated in Figure 2.9, the KAB model visually presents the improved logical relationships among knowledge, attitude, and behavior.

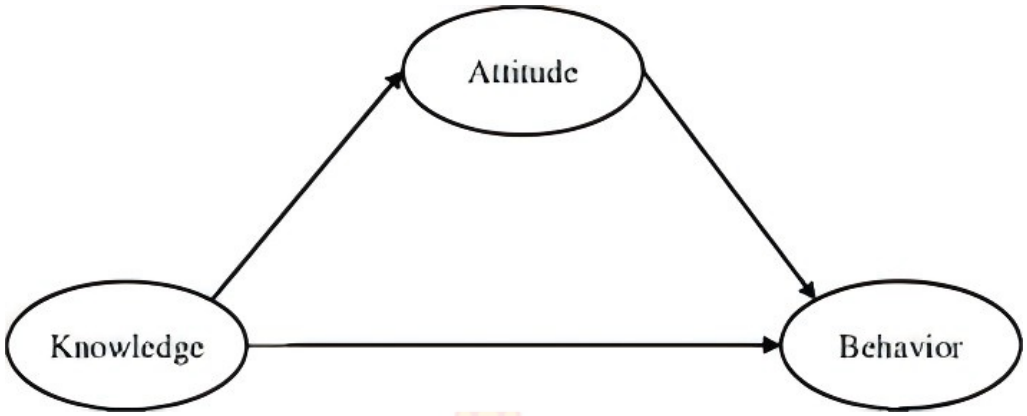

Figure 2.9 Knowledge-Attitude-Behavior (KAB) Model
Source: Sanlier and Baser (2020)

In the field of health management, the KAB model is widely used in scenarios such as disease care and health education. The model provides a theoretical framework for assessing individuals' mastery of health-related knowledge, attitude orientation, and behavioral practices. For example, in health education, the KAB model is used to study how individuals' cognition and attitudes toward specific diseases influence their preventive behaviors or treatment compliance (Ng, 2024).

With the deepening of research, the application scope of the KAB model has gradually extended beyond health management to other areas, especially emerging fields such as green consumption and food consumption behavior (Koc et al., 2025; Temizkan, 2022). The formation of consumers' green purchase decisions is a process shaped by multiple factors. Knowledge, as a foundational factor, interacts with psychological variables such as emotional attachment and brand trust to jointly influence purchasing behavior (Syed et al., 2024). In the food consumption sector, although consumer knowledge level and environmental attitudes significantly affect food preferences, these effects do not always directly translate into actual green purchasing behavior (Witek & Kuźniar, 2023). This phenomenon is especially pronounced among university student groups, where research has shown that although this group generally possesses a higher level of knowledge, there is a significant lag in terms of attitude and practice (Irazusta-Garmendia et al., 2023). These findings indicate that although the KAB model can partially explain green consumption behavior, the transformation from knowledge to behavior is often moderated by attitudes and situational factors, presenting a complex transmission mechanism.

Knowledge, defined as the facts, skills, and understanding individuals acquire through learning, experience, and information , plays a fundamental role in the field of food consumption (Paula Silva et al., 2023). In the KAB model, systematically organized knowledge not only provides an informational foundation for individual decision-making but also promotes behavioral change by influencing attitude formation (da Cunha et al., 2022). Food knowledge is a key factor influencing consumer purchase decisions, with food cognition regarded as an important determinant in consumer choices (Van der Merwe et al., 2022). Consumers' food knowledge can be divided into subjective knowledge and objective knowledge. Subjective knowledge refers to an individual's perception of a product or attribute information, while objective knowledge emphasizes the accuracy of information (van der Merwe et al., 2024). Mastery of objective knowledge is crucial because it can reinforce the influence of subjective knowledge on attitudes toward organic food purchases (Fatha & Ayoubi, 2023). Thus, both consumers' subjective and objective knowledge about green food may positively drive their purchase decisions.

Attitude refers to an individual's evaluative disposition toward a particular object, concept, or behavior. It is widely recognized as a key predictor of behavioral intention and acceptance of new practices (Ajzen & Fishbein, 2000).Within the KAB model, knowledge and behavior are treated as objective constructs, while attitude is commonly assessed using subjective or psychological measures (Jiang et al., 2025; Teo et al., 2023).

Recent research has increasingly recognized that consumer food choices are not merely shaped by a singular "attitude" variable, but rather by multiple underlying cognitive evaluations. Nam and Pak (2023) proposed a measurement approach in which health-related attitude is conceptualized as a multidimensional latent construct comprising the four core variables of the health belief model—perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. Instead of treating attitude as a global evaluative judgment, they used these specific health belief dimensions to capture the structure of health attitude more precisely. Similarly, Zhang et al. (2022) demonstrated that health literacy influences health behaviors through these four HBM dimensions, highlighting their critical mediating role.

Building on these insights, this study conceptualizes attitude as a multi-dimensional construct operationalized through the HBM framework. This approach allows for a more nuanced investigation of how belief-based perceptions influence green food

consumption behavior. Attitudes have been confirmed to play a key mediating role (Rashid & Lone, 2024). Numerous empirical studies have revealed the complex relationship between attitudes and behavior:

Table 2.3 Summary of Key Findings on the KAB model in Food Consumption

Source	Key Findings	Context
Sethi and Rastogi (2023)	Attitudes exert a much stronger influence on healthy eating behavior than knowledge.	Based on a survey of 139,832 middle school students, knowledge influences behavior primarily by shaping positive dietary attitudes.
Loussaief et al. (2024)	Positive attitudes mediate the effect of knowledge on halal food purchasing behavior.	Turkish consumers' halal food behavior shows that product knowledge and risk perception shape attitudes through cognitive pathways.
Ogiemwonyi et al. (2023)	Attitude mediates the link between environmental responsibility and green purchasing behavior.	In the Chinese market, environmental responsibility influences green food purchases through the mediation of attitudes.
Tan et al. (2022)	Positive attitude is significantly associated with green food purchase likelihood.	Attitudes are strong predictors of green food consumption behavior in China.
Rashid and Lone (2024)	Attitude is both shaped by knowledge and mediates its effect on behavior.	The dual role of attitude makes it central in understanding the knowledge–attitude–behavior pathway in food consumption.

Table 2.3 presents empirical findings that support the knowledge attitude behavior (KAB) framework in the context of food consumption. The studies highlight how knowledge influences behavior mainly through attitudes, which act both as a mediator and a dependent variable

Therefore, this study replaces the traditional unidimensional attitude construct in the KAB model with four belief-based components from the HBM, aiming to provide a

more nuanced and theoretically grounded explanation of how health-related attitudes mediate the relationship between knowledge and green food consumption behavior.

Specifically, the study integrates the KAB and HBM frameworks to investigate green food consumption behavior among Chinese women. Knowledge is measured through both subjective and objective knowledge of green food (Fatha & Ayoubi, 2023), while attitude is operationalized using four key health belief dimensions: perceived benefits, perceived barriers, perceived susceptibility, and perceived severity (Nam & Pak, 2023). By adopting this multidimensional approach, the study seeks to clarify the pathways through which different forms of knowledge shape health beliefs, and in turn, influence actual consumption behavior.

2.3 Immediate Disciplines

2.3.1 Subjective Knowledge of Green Food

Knowledge, defined as the facts, skills, and understanding individuals acquire through learning, experience, and information , plays a fundamental role in the field of food consumption (Guiné et al., 2023). Consumers' food knowledge can be divided into subjective knowledge and objective knowledge. Subjective knowledge refers to an individual's self-perceived level of knowledge in a particular domain. Unlike objective knowledge, it reflects "how much one thinks they know" rather than the actual amount of information mastered (van der Merwe et al., 2024).

In the realm of green and organic foods,perceived environmental knowledge involves individuals' self - awareness of environmental problems, their causes, impacts, and the actions necessary to address these issues (de Sio et al., 2022). It is further divided into self - perception and familiarity with the environmental problems themselves, related terminologies, causes, and key actions such as production, packaging, labeling, and recycling.Subjective knowledge is defined as consumers' self - assessment of their knowledge level and confidence in healthy food field, involving their knowledge of healthy foods, their perception of having an edge in healthy food knowledge compared to peers, and their confidence in identifying health - promoting foods (van der Merwe et al., 2024). Subjective knowledge focuses on consumers' self-perceived level of understanding and confidence. Subjective knowledge is systematically categorized into three core dimensions (Flynn & Goldsmith, 1999). The first is the self-perceived superiority

dimension, which focuses on individuals' subjective assessment of their own knowledge reserve of healthy foods compared to the average person. The second is the methodological proficiency dimension, emphasizing consumers' self-perceived grasp of methods and techniques for evaluating the quality of healthy foods. The third is the social recognition dimension, reflecting individuals' subjective knowledge level from the perspective of others and demonstrating the degree of social recognition individuals receive regarding their knowledge of healthy foods. In the field of organic food research, these three dimensions of subjective knowledge have also been extensively explored (Fatha & Ayoubi, 2023).

Therefore, subjective knowledge in this study refers to what consumers think they know about green foods and the extent of their perceived knowledge. As a key independent variable, subjective knowledge is expected to influence consumers' attitudes and consumption behaviors. This offers a novel research perspective for promoting food consumption among Chinese women.

2.3.2 Objective Knowledge of Green Food

Objective knowledge refers to the actual knowledge that is accurately stored in consumers' long-term memory. These discrepancies mainly arise from individuals' tendencies to overestimate or underestimate their factual knowledge. They become apparent when individuals' subjective knowledge levels diverge from their objective knowledge levels, either being disproportionately higher or lower (Menozzi et al., 2023).

In the study exploring consumers' choices of healthy lifestyles, objective knowledge is defined as the specific information consumers actually possess regarding healthy foods. This information is measured through declarative questions in the questionnaire covering dimensions such as weight and cholesterol, specific scenarios, as well as food misconceptions and controversies (Fatha & Ayoubi, 2023). In a study on South African consumers' food-related decision - making, objective knowledge was defined as factual, bias-free information, covering dimensions such as verifiable facts about food production, comprehension of dietary principles, and the capacity to assess information accuracy, enabling consumers to better navigate the marketplace (van der Merwe et al., 2024). In the field of organic food research in Lebanon, objective knowledge is assessed by developing a questionnaire scale containing factual questions, encompassing aspects such as experiential memory related to products, information on

specific product categories, and awareness of environmental protection (Fatha & Ayoubi, 2023). During the research process on green tea, objective knowledge is subdivided into knowledge regarding the meaning, system, and labeling aspects of green tea (Zheng et al., 2022).Organic foods differ from conventional foods. To accurately assess respondents' awareness levels of organic foods, a study has delved into in - depth investigations by defining subjective knowledge across dimensions such as the comparison of health benefits between organic and conventional foods, production processes, safety aspects, composition and processing, organic certification, and market perception.

Therefore, objective knowledge refers to the amount of accurate actual information about such foods they can recall from information stored in their memory. This study draws on the categorization of objective knowledge regarding organic foods proposed by Malkanthi et al. (2021). Objective knowledge is segmented into dimensions such as the comparison of health benefits of organic foods, production processes, safety attributes, composition and processing approaches, organic certification, and market perception. It systematically explores the anticipated influence of objective knowledge on consumers' attitudes and consumption behaviors, thereby offering a novel research vantage - point for promoting food consumption among Chinese women.

2.3.3 Consumption Behavior toward Green Food

While consumer behavior can be defined in various ways, the knowledge attitude behavior (KAB) model is a specific framework that posits that a consumer's knowledge about a product or service, their attitude towards it, and their resulting behavior are interconnected and influence each other (Jin et al., 2024). The KAB model suggests that consumer behavior is driven by a combination of what they know, how they feel about it, and what they actually do (Teo et al., 2023).

Consumption behavior is a set of principles applied during the consumer process to select and purchase better products. In studies on consumer behavior, the purchase decision process is commonly seen as a dynamic process composed of multiple stages (Towers & Towers, 2022). Although the specific stages and their descriptions may vary across studies, it is generally agreed that purchasing behavior is the key outcome of the decision process, marking the transformation from intention to actual action (Wang et al., 2021). Purchasing behavior concretely embodies consumer decisions and attitudes. And

defined as the actual act of consumers acquiring products or services (Witek & Kuźniar, 2023).

Green food purchasing behavior refers to consumers' actual actions with respect to products bearing green food certification labels, including purchasing frequency, expenditure on green products, and the quantity of green products purchased (Zhu et al., 2013). Purchasing actions are influenced by personal attitudes, health awareness, and perceived attributes such as certification labels and product quality (Firoozzare et al., 2024). Green purchasing behavior is related to consumers' attitudes, knowledge, and past consumption behavior regarding green food (Witek & Kuźniar, 2023). Understanding of green food is particularly important for green food purchasing behavior.

In the context of this study, and based on the definition by Zhu et al. (2013), green food purchasing behavior is defined as consumers' consistent actions of purchasing, selecting, and recommending food products carrying green food certification labels.

2.3.4 Perceived Benefits

Perceived benefit is a core concept within the health belief model (HBM) and refers to an individual's belief that engaging in a specific health behavior will reduce disease risk or improve health status (Rosenstock, 1974). In its early stages, the concept of perceived benefit was mainly utilized in the study of preventive health behaviors (Janz & Becker, 1984). With the development of consumer behavior research, the theoretical and practical significance of perceived benefits has attracted increasing attention. In recent years, the number of studies examining consumers' perceived benefits of various products has grown significantly, gradually forming a more systematic research framework.

Consumers usually regard green food as a reliable and safe product free from pollution (Van Bussel et al., 2022).In specific consumption contexts, consumers' perceived benefits mainly focus on three aspects: First, the health aspect, that is, believing that green food is more natural, has fewer pollutants, and is more beneficial to the health of themselves and their family members (Wang et al., 2024). Second, the psychological and trust aspect, that is, believing that the certification and label information of green food enhance its safety and reliability (Martey, 2025). Third, the decision - support aspect, such as believing that the clear information of green food helps them make wise purchase choices (Wang et al., 2021). These dimensions jointly form a multi-dimensional cognitive

basis for perceived benefits, providing theoretical support for explaining the relationship between consumers' attitudes and behaviors.

Perceived benefit refers to consumers' assessment of how a product's attributes and performance can effectively help them achieve their goals or intentions (Wang et al., 2024). In the research related to organic beef, the perceived benefits measure consumers' subjective cognition of the benefits of organic beef from three aspects: health improvement, enhanced sense of security, and family nutrition (Wang et al., 2024). It comprehensively reflects consumers' perceptions at the health and psychological levels, providing key evidence for analyzing consumers' attitudes and behaviors towards organic foods.In the study of consumers' purchase intention of green food, the variable of "Perceived Benefits" is used to measure consumers' cognition of the subjective benefits brought by green food (Martey, 2024). The specific measurement indicators of this variable include: consumers believe that green food is beneficial to health, can prevent diseases, is a worthwhile purchase choice, label information helps to make good decisions, and green food is of great significance to the health of themselves or their families. This construct reflects consumers' expectations at the health level .

In this study, perceived benefit is considered a key variable and is defined as the belief in the health benefits that green food can bring (Martey, 2024). Exploring the role of perceived benefits in food consumption behavior helps to better understand the green food consumption patterns of Chinese women and provides a theoretical foundation for the expansion of the green food market in China.

2.3.5 Perceived Barriers

In the health belief model (HBM), perceived barriers are a key factor influencing whether individuals engage in preventive health behaviors. Perceived barriers, together with perceived benefits, jointly affect an individual's decision to adopt preventive actions. Perceived barriers represent the various factors an individual perceives as obstacles to performing a behavior or obtaining benefits from a product (Rosenstock, 1974).

Within the HBM framework, perceived barriers encompass multiple aspects of product experience, including both specific difficulties encountered during actual product use and psychological concerns that arise in the decision-making process. Perceived barriers typically include costs such as time, money, effort, emotions, and social pressure, all of which may hinder individuals from adopting healthy behaviors.

In the context of healthy food choices, perceived barriers can influence the likelihood of healthy eating through factors like convenience (Magalhães et al., 2022). In the food consumption domain, perceived barriers have a negative effect on Malaysian elderly consumers' intentions to consume functional foods (Febian et al., 2021). In the research on the inclination to reduce meat consumption, perceived barriers are meticulously categorized into four primary aspects: taste preference barriers, habitual inertia barriers, cultural belief barriers, and social interaction barriers (Kemper et al., 2022). When studying the factors influencing farmers' willingness to use biopesticides, perceived barriers mainly focus on information barriers, family role barriers, time management barriers, and social pressure barriers, revealing potential constraining mechanisms affecting green food choices from two dimensions: individual cognition and living conditions (Kaur et al., 2024). In the study of green food consumption, perceived barriers are concentrated on information barriers (lack of health knowledge), family role barriers (restricted dietary decision-making), time management barriers, and social pressure barriers (Martey, 2024, 2025). These barriers reveal the potential constraining mechanisms influencing green food choices from both individual cognitive and life-situational dimensions .

In this study, perceived barriers are defined as individuals' beliefs regarding the psychological, accessibility, and practical costs faced in consuming green food (Martey, 2025).

2.3.6 Perceived Susceptibility

Perceived susceptibility, as a core variable in the health belief model (HBM), reflects an individual's subjective assessment of the likelihood that a specific behavior could lead to illness or an unhealthy state (Rosenstock, 1974). In the HBM, perceived severity and perceived susceptibility together constitute the key concept of "perceived threat," affecting an individual's health behavior. The model suggests that when people believe they are vulnerable to certain negative health outcomes, their perceived susceptibility increases. As research has progressed, the scope of perceived susceptibility has expanded—it now covers not only the individual's perception of personal risk of physical disease but also awareness of health threats posed by environmental factors (Ataei et al., 2021).

When consumers perceive themselves to be at higher health risk, they are more likely to choose foods with health guarantees. Perceived susceptibility was defined as consumers' perception of their likelihood of being diagnosed with a disease or falling ill (Glick et al., 2024). When studying consumers' willingness to purchase such foods, perceived susceptibility was subdivided into two aspects: first, an individual's perception of their risk control in disease scenarios; second, awareness of existing health issues within the family and perception of one's own likelihood of illness based on family medical history.The study on purchasing organic beef defined perceived susceptibility as consumers' concerns about purchasing potentially contaminated beef, encompassing risk perceptions triggered by factors such as microbial contamination, veterinary drug residues, and chemical pollution (Wang et al., 2024).

Perceived susceptibility also refers to an individual's subjective assessment of their risk of experiencing certain health threats (Taflinger & Sattler, 2024). For example, when a young person has friends or family with diet-related illnesses, their perceived health risk may increase. In the context of green food, health risk susceptibility refers to consumers' perception that eating non-green foods may expose them to health hazards such as pesticide residues or additives, thus prompting them to choose green foods (Pinto et al., 2021).

In this study on Chinese women’s green food consumption behaviors, perceived susceptibility is conceptualized as Chinese female consumers’ perception of health risks when purchasing green foods (Wang et al., 2024).

2.3.7 Perceived Severity

Perceived severity is one of the key elements of the health belief model (HBM), referring to individuals’ subjective judgment of how serious the health problems or adverse outcomes caused by a particular behavior are (Rosenstock, 1974). Since its introduction, perceived severity has been widely applied in public health and behavioral sciences to explain and predict health-related behaviors (DeDonno et al., 2022; Taflinger & Sattler, 2024). Early research mainly explored perceived severity in the context of disease prevention and health behaviors (Janz & Becker, 1984). Over time, its value has become evident in other areas such as consumer behavior and environmental protection. In consumer behavior research, attention is paid to consumers' awareness of the seriousness

of risks associated with product purchase and use, which is critical to understanding the consumer decision-making process (Yazdanpanah et al., 2022).

In specific scenarios, perceived severity refers to the extent of consumers' perception of the potential negative outcomes of a product. For example, in food consumption, concerns about pesticide residues and additives in conventional foods reflect consumers' perception of the severity of food safety risks (How et al., 2024). When exploring the willingness for green food production, the concept of perceived severity can be refined into four aspects: individuals' awareness of the inhibitory effect of pesticides and fertilizers on agricultural yields, concerns about environmental damage caused by the excessive use of chemicals in the present and future, perception of the harm inflicted on soil by chemical pesticides and fertilizers, and alertness to the risks that unhealthy food consumption poses to public health (Kaur et al., 2024). In the context of organic food, when consumers perceive the health and environmental risks of conventional food production as severe, they are more inclined to choose organic foods (Roy et al., 2023). Perceived severity is defined as the individual's concern about the health risk caused by purchasing beef containing veterinary drug residues, which is used to assess consumers' willingness to buy organic beef (Wang et al., 2024). Furthermore, the study indicates that perceived severity primarily encompasses subjective perceptions of personal and family health risks, environmental and ecological damage, as well as public health risks to society. Health beliefs formed by perceived severity and perceived susceptibility are important factors influencing consumers' willingness to purchase organic beef.

In this study, perceived severity is defined as consumers' concern about health threats caused by purchasing non-green foods containing pesticide residues (Wang et al., 2021). This definition helps further analyze consumers' green food purchasing behavior and explore the factors influencing the development of the green food market, providing a theoretical basis for policy-making and market strategy.

2.3.8 Cue to Action

Cue to action is a supplementary but critical construct within the health belief model (HBM), referring to the internal or external stimuli that activate individuals' readiness to perform a health behavior (Rosenstock, 1974). Initially, this concept was employed to explain how individuals respond to public health campaigns, physician recommendations, or illness symptoms by adopting preventive behaviors. As the HBM

evolved, cue to action has been increasingly applied to broader domains such as food choice and food consumtion (Daniels et al., 2025; Abigail A Glick et al., 2024).

Cue to action plays a pivotal role in motivating individuals to embrace necessary behavioral changes (Abigail A Glick et al., 2024). These cues are derived from two primary sources: internal triggers, such as fear of illness and recognition of disease symptoms, and external triggers, like media messaging.These prompt information is considered an important trigger for individuals to adopt healthy consumption behaviors.

In the context of food consumption, cue to action reflects those triggers that motivate consumers to consider, evaluate, and ultimately act on health-related food choices (Khan & Pandey, 2023). In a study applying the health belief model to predict the likelihood of nutrient-dense food intake among American adults, the cue-to-action variables encompassed three dimensions: whether participants would alter their behaviors based on recommendations from healthcare professionals, media, or friends and family (Abigail A Glick et al., 2024). In a study on "functional food consumption" among elderly consumers conducted in Malaysia, researchers used statements such as "My doctor thinks I should consume functional foods" to evaluate the effectiveness of external cues (Febian et al., 2021).

In this study, cue to action is defined as the presence of external or internal triggers that stimulate Chinese female consumers' motivation to purchase green food (Abigail A Glick et al., 2024). Incorporating this construct into the HBM framework helps to better explain the dynamic transition from health beliefs to behavioral execution, particularly in the consumption of health-oriented food products such as green and organic food.

Table 2.4 Empirical Summary of Research on Knowledge and HBM in Food Consumption

Source	Context	Theory	Subjective Knowledge	Objective Knowledge	Health Beliefs (HBM)	Integrated Model
Glick et al. (2024)	Green and Organic Food (General Consumers)	HBM	×	√	√	No

Table 2.4 (continued)

Source	Context	Theory	Subjective Knowledge	Objective Knowledge	Health Beliefs (HBM)	Integrated Model
Wang et al. (2021)	Healthy Food (Chinese Consumers)	KAB	√	×	×	No
Flynn & Goldsmith (1999)	General Consumer Behavior	KAB	√	×	×	No
Malkanthi et al. (2021)	Organic Food (Sri Lankan Consumers)	TPB	×	√	-	No
Daniels et al. (2025)	Nutrient-Dense Foods (American Adults)	HBM	×	×	√	No
Febian et al. (2021)	Health-Oriented Products (Malaysian Elderly)	HBM	×	√	√	No
Khan & Pandey (2023)	Green Food (Indian Market)	TPB / HBM	√	×	√	No
Guiné et al. (2023)	Food Consumption (European Context)	KAB	√	√	×	No
de Sio et al. (2022)	Environmental Food Choices (Italian Consumers)	None Specified	√	×	×	No
van der Merwe et al. (2024)	Green and Organic Food (General Consumers)	KAB	×	√	×	No

2.4 Conceptual Framework and Hypothesis Development

2.4.1 Conceptual Framework

Based on the Knowledge–Attitude–Behavior (KAB) model and the Health Belief Model (HBM), this study develops a theoretical framework to explain green food consumption behavior among Chinese women. In line with the KAB logic, knowledge is treated as an upstream determinant that shapes individuals' evaluative cognitions and, in turn, influences behavioral outcomes. In this study, the "attitude" component of KAB is operationalized through the core perceptual constructs of HBM, including perceived susceptibility, perceived severity, perceived benefits, and perceived barriers, which represent consumers' health-related beliefs when evaluating green food consumption.

Accordingly, the framework specifies subjective knowledge of green food and objective knowledge of green food as the two primary knowledge-based antecedents. The model proposes that both forms of knowledge may influence consumption behavior in two ways. First, knowledge may exert direct effects on consumption behavior, reflecting the possibility that consumers who perceive themselves as knowledgeable or who possess factual knowledge are more likely to adopt certified green food consumption. Second, knowledge may indirectly influence consumption behavior through health belief perceptions. Specifically, consumers' knowledge is expected to shape perceived susceptibility and perceived severity regarding health risks, as well as perceived benefits and perceived barriers associated with green food consumption. These health belief components then function as mediating mechanisms linking knowledge to actual consumption behavior.

In addition to the knowledge–belief pathways, the framework incorporates cue to action as a triggering factor derived from HBM. In this model, cue to action is specified as an exogenous predictor that directly promotes consumption behavior toward green food, capturing the role of external or contextual prompts that activate consumers' behavioral responses.

Finally, sociodemographic characteristics, including marital status, education level, household income, and age, are included as control variables. These variables are used to control for potential differences in consumption behavior associated with individual background factors, thereby improving the robustness and interpretability of the hypothesized relationships in the proposed model. As illustrated in Figure 2.10, the model

integrates subjective knowledge, objective knowledge, perceived benefits, perceived barriers, perceived susceptibility, perceived severity, and cue to action to explain consumption behavior toward green food.

Table 2.5 Table of Study Variables

Category	Variable
Dependent variable	Consumption Behavior toward Green Food
Independent variable	Subjective Knowledge of Green Food, Objective Knowledge of Green Food, Cue of Action
Mediator variable	Perceived Benefits ,Perceived Barriers ,Perceived Susceptibility , Perceived Severity
Control Variables	Marital Status, Education Level, Household Income, Age

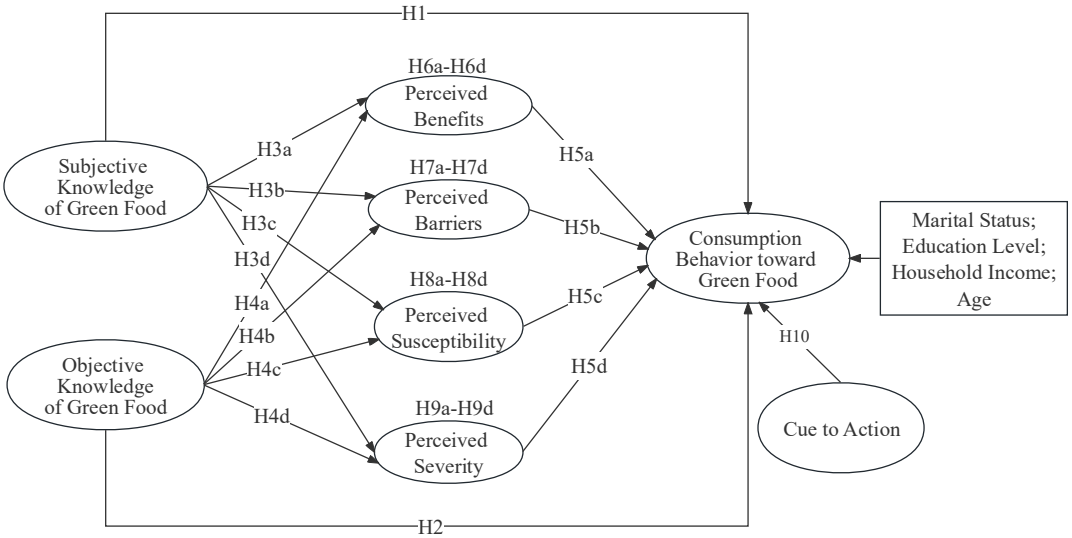

Figure 2.10 Conceptual Model of Consumption Behavior toward Green Food

2.4.2 Hypothesis Development

Objective knowledge refers to consumers' factual understanding of green food and its related attributes, which provides an informational basis for evaluating product quality, certification meaning, and potential health and sustainability outcomes. Existing studies suggest that improving consumers' knowledge through targeted marketing and educational initiatives can translate into more favorable purchasing decisions, particularly when products require consumers to interpret technical or novel information, such as innovative

food products (Roberto et al., 2026). From a sustainable consumption perspective, research has also emphasized that consumer knowledge should be incorporated into communication strategies because it helps shape consumers' perceptions and supports more informed and consistent sustainable food choices (Tseng et al., 2021). Evidence from different food consumption contexts further indicates that when consumers possess stronger product-related knowledge, they are more capable of recognizing and evaluating key product cues (van Bussel et al., 2022), which can strengthen purchase intentions and actual consumption behaviors, as reflected in studies on sustainable tea consumption where knowledge interacts with perceived quality and trust to influence behavior (Zheng et al., 2022).

At the same time, the literature also shows that the knowledge–behavior relationship is not mechanically deterministic. Some studies report that situational constraints and contextual conditions may outweigh knowledge effects in certain settings, such as organic food purchasing in urban Hanoi (Tran & Nguyen, 2021), while other work highlights that individual preferences and values can shape food choices even when knowledge is present (Blake et al., 2023; Claessens et al., 2023). External shocks can also reconfigure purchasing priorities, as illustrated by changes in food preferences during the COVID-19 lockdown period (Li et al., 2021). In addition, trust-related factors often interact with consumers' knowledge in shaping green purchasing behavior, suggesting that knowledge may operate within a broader decision environment where trust in the food system and brand legitimacy influences consumers' willingness to act on what they know (Dong et al., 2022). Research on novel environmentally friendly products similarly implies that product characteristics and marketing cues may condition how knowledge is translated into attitudes and behaviors (Ma & Chang, 2022).

Overall, despite the presence of situational, motivational, and trust-related contingencies, the accumulated evidence consistently supports objective knowledge as a substantive antecedent of consumers' sustainable food-related decisions. Given that green food consumption involves interpreting certification cues and product information, higher levels of objective knowledge are expected to increase the likelihood of adopting and maintaining actual green food consumption behavior. Therefore, this study proposes:

H1: Consumers with higher levels of objective knowledge about green food are more likely to engage in green food consumption behavior.

Subjective knowledge refers to consumers' self-perceived understanding and confidence in what they know about green food, which can shape how they evaluate product information and decide whether to translate awareness into actual consumption behavior (Towers & Towers, 2022). Compared with objective knowledge, subjective knowledge emphasizes perceived familiarity and cognitive certainty, and it often exerts a direct influence on behavior because consumers tend to act on what they believe they know, especially in food contexts where product attributes and certification meanings may not be fully transparent (Rihn et al., 2021). Empirical evidence indicates that enhancing consumers' perceived knowledge can strengthen their acceptance and purchasing intentions toward innovative and sustainable food products (Kamboj et al., 2023; Ngo et al., 2024). For example, consumers who feel more knowledgeable about artificial meat are more likely to develop favorable evaluations and show stronger purchase intentions, suggesting that perceived knowledge can function as an immediate psychological driver of food-related decisions (Xie et al., 2023). In sustainable tea consumption, subjective knowledge has also been shown to contribute to purchase behavior by increasing consumers' perceived product quality and reinforcing decision confidence, thereby promoting more consistent adoption of sustainable food options (Zheng et al., 2022).

Further studies in emerging market settings similarly highlight that subjective knowledge supports green purchasing by strengthening consumers' responsiveness to environmental motivations and decision cues. When consumers perceive themselves as knowledgeable, they are more likely to interpret green attributes as personally relevant and worthwhile, which increases the likelihood of engaging in sustainable consumption practices. However, the relationship between knowledge and behavior can still be context-dependent. Research on organic food consumption suggests that situational constraints may affect whether perceived knowledge is converted into actual purchasing, implying that subjective knowledge operates within a broader consumption environment rather than acting in isolation (Chiew et al., 2023). In addition, subjective knowledge is intertwined with risk perception and food safety considerations, as consumers who feel more informed may respond more strongly to perceived risks or safety signals, which can further motivate their behavioral choices (Mucinhato et al., 2022). Recent evidence also supports the role of green knowledge as a key motivational factor associated with green food purchasing

behavior, reinforcing the relevance of perceived knowledge in shaping sustainable consumption outcomes (Cheng et al., 2024).

Taken together, the literature supports the argument that subjective knowledge can directly encourage consumers to adopt green food consumption behavior by enhancing perceived familiarity, decision confidence, and responsiveness to green product cues. Therefore, this study proposes:

H2: Consumers with higher levels of subjective knowledge regarding green food are more inclined to perform green food consumption behavior.

Subjective knowledge captures consumers' self-perceived understanding and confidence regarding green food, which is especially consequential in food choices where certification meanings, production claims, and health implications are not directly observable and must be inferred from information cues. When consumers believe they "know enough," they typically process green food information with higher certainty, rely less on ambiguity-driven avoidance, and evaluate health-related messages with stronger personal relevance (Penzavecchia et al., 2022). From a Health Belief Model perspective, this perceived understanding is expected to systematically shape the core belief components that underpin health-oriented consumption decisions. Specifically, stronger subjective knowledge should heighten perceived benefits because confident consumers are more likely to recognize and value green food's promised advantages, such as health-related and quality-related gains, and to interpret product claims in a favorable and meaningful way.

At the same time, perceived knowledge should reduce perceived barriers by lowering uncertainty, improving decision confidence, and making potential obstacles (e.g., difficulty evaluating authenticity, information complexity, or hesitation about choosing among alternatives) seem more manageable; the health belief literature consistently indicates that barrier perceptions diminish when individuals feel more capable and equipped to act (Fang et al., 2025), and evidence from applied contexts similarly suggests that greater perceived competence can weaken perceived obstacles and hesitation (Ani et al., 2025).

Moreover, subjective knowledge can strengthen threat appraisal. Consumers who feel more knowledgeable often show greater sensitivity to risk information and stronger confidence in judging vulnerability and seriousness, which can elevate perceived

susceptibility to the risks associated with unhealthy or non-green food consumption (Rembischevski & Caldas, 2023; Silva et al., 2023). Related research on environmental and health hazards also suggests that higher subjective knowledge can be associated with stronger risk-related perceptions (Zeng et al., 2023), reinforcing the idea that perceived understanding may amplify perceived vulnerability and seriousness rather than merely reassure consumers.

In addition, subjective knowledge has been shown to influence perceived severity alongside other belief components in extended HBM applications, supporting its role in shaping how strongly individuals judge the consequences of a health threat (Wang et al., 2024). Taken together, these arguments indicate that subjective knowledge does not simply predict green food behavior directly, but also functions as an upstream cognitive condition that simultaneously strengthens benefit appraisal, reduces barrier salience, and intensifies risk-related threat appraisal (susceptibility and severity), thereby preparing consumers to adopt green food consumption through a coherent belief system.

Therefore, this study proposes the following hypotheses:

H3a: Subjective knowledge positively influences perceived benefits of green food.

H3b: Subjective knowledge negatively influences perceived barriers to green food consumption.

H3c: Subjective knowledge positively influences perceived susceptibility to risks associated with non-green food.

H3d: Subjective knowledge positively influences perceived severity of the consequences of unhealthy food consumption.

Objective knowledge refers to consumers' factual and verifiable understanding of green food, including certified labeling meaning, production standards, and health-related information that can be checked against objective criteria (Zhang et al., 2025). Compared with subjective knowledge, objective knowledge is less dependent on confidence and more closely reflects what consumers actually know, which can improve the accuracy and stability of health-related appraisals (Mynaříková & Pošta, 2023). In food choice contexts where consumers must interpret certification cues and evaluate health and safety implications, stronger objective knowledge provides a cognitive foundation for forming more differentiated benefit–cost judgments and for conducting more systematic threat

appraisal (Fernqvist et al., 2024). From the Health Belief Model perspective, factual knowledge is expected to shape the four core belief components by clarifying what green food offers, what obstacles are real versus assumed, and what risks are associated with unhealthy food alternatives.

Specifically, higher objective knowledge should enhance perceived benefits of green food because consumers with more factual understanding are better able to recognize concrete advantages such as improved safety, nutritional quality, and reduced exposure to potential contaminants, thereby strengthening benefit evaluation and increasing the perceived value of certified green food. Empirical evidence across health and food-related domains consistently indicates that increased objective knowledge is associated with stronger benefit perceptions and more favorable evaluations of health-related actions (Baker et al., 2022; Boncompagni et al., 2025). For instance, greater objective knowledge has been linked to higher perceived benefits and more supportive beliefs toward vaccination and other preventive behaviors, demonstrating that factual understanding can reinforce the perceived payoff of adopting health-protective choices. In food innovation contexts, objective knowledge has also been found to correlate with more favorable benefit–risk assessments, suggesting that factual knowledge can increase the salience of perceived benefits when consumers evaluate complex products (Shen et al., 2025). By extension, objective knowledge about green food certification and product attributes should increase perceived benefits in the green food domain.

At the same time, objective knowledge should reduce perceived barriers because factual understanding can correct misconceptions, lower information ambiguity, and provide clearer decision rules for evaluating authenticity and product claims. Research across multiple applied contexts shows that individuals with greater objective knowledge tend to perceive fewer barriers to adopting recommended health or pro-environmental actions, as knowledge reduces uncertainty and increases perceived feasibility. For example, higher objective knowledge has been associated with lower perceived barriers when individuals evaluate non-toxic materials or other health-related choices, indicating that factual information can weaken perceived obstacles that stem from uncertainty or unfamiliarity (Glaser et al., 2022). Similar patterns have been observed in prevention and professional practice contexts, where greater knowledge reduces perceived challenges and increases readiness to act, implying that knowledge-based capacity building can directly

diminish barrier perceptions (Singh et al., 2023). In green food consumption, objective knowledge can thus be expected to reduce perceived barriers by clarifying standards, labels, and practical decision criteria.

Moreover, objective knowledge is likely to strengthen threat appraisal, thereby increasing perceived susceptibility and perceived severity regarding unhealthy food consumption. When consumers possess accurate information about food-related risks and health consequences, they may become more aware of the likelihood of experiencing adverse outcomes (susceptibility) and more convinced that those outcomes are serious (severity). Health belief research shows that objective knowledge often predicts higher perceived susceptibility and stronger precautionary orientations, particularly when knowledge increases awareness of risk mechanisms and personal exposure pathways (Surma et al., 2025; Taflinger & Sattler, 2024). Likewise, objective knowledge has been shown to elevate perceived severity in public health contexts, as individuals who better understand a health threat tend to judge its consequences as more serious and requiring preventive action (Melki et al., 2022; Mohammed et al., 2023). Translating these insights into the green food context, consumers with greater objective knowledge should perceive stronger vulnerability to the risks associated with unhealthy or non-green food and evaluate the consequences of unhealthy consumption as more severe, thereby motivating protective consumption choices.

Therefore, this study proposes the following hypotheses:

H4a: Objective knowledge positively influences perceived benefits of green food.

H4b: Objective knowledge negatively influences perceived barriers to green food consumption.

H4c: Objective knowledge positively influences perceived susceptibility to risks linked to unhealthy food consumption.

H4d: Objective knowledge positively influences perceived severity of the consequences of unhealthy food consumption.

Perceived benefits, perceived barriers, perceived susceptibility, and perceived severity constitute the core belief components of the Health Belief Model and collectively represent the psychological appraisal system through which consumers decide whether to adopt a health-related behavior (Rosenstock, 1974). In the context of green food, these

beliefs shape how consumers evaluate the attractiveness and feasibility of choosing certified products, as well as how strongly they feel motivated to avoid the potential risks associated with unhealthy or non-green food alternatives. When consumers believe that green food can deliver meaningful advantages, they are more likely to translate favorable evaluations into actual purchasing and consumption. Prior research consistently indicates that perceived benefits are a strong positive driver of health-oriented and sustainable consumption, particularly when consumers associate green products with improved quality, safety, and personal well-being, which increases willingness to pay and strengthens behavior adoption (Gomes et al., 2023; Lopes et al., 2024). Such benefit perceptions also become especially influential when heightened awareness of health and environmental issues makes the advantages of green products more salient in everyday decision-making (Huo et al., 2025).

In contrast, perceived barriers function as inhibiting beliefs that reduce the likelihood of behavior enactment. Even when consumers recognize potential benefits, barriers such as higher price, limited availability, inconvenience, uncertainty about authenticity, or doubts about taste and value can prevent consumers from acting on their preferences. The green consumption literature has repeatedly shown that perceived costs and constraints can significantly weaken sustainable purchasing, illustrating that barrier perceptions often explain why pro-environmental intentions fail to translate into actual behavior (Sharma, 2024; Shen & Wang, 2022). In green food contexts, reducing perceived barriers is therefore crucial for promoting adoption, because consumers are less likely to engage in certified green food consumption when obstacles are seen as substantial and persistent.

Beyond benefit–barrier evaluations, threat appraisal also motivates protective consumption. Perceived susceptibility captures the extent to which consumers believe they or their families are likely to experience negative outcomes from unhealthy food choices, while perceived severity reflects how serious they judge those consequences to be. When consumers feel more vulnerable to health risks and believe that the consequences are serious, they are more likely to adopt preventive actions, including shifting toward food options that are perceived as safer or healthier. Studies on green and organic consumption indicate that heightened risk perception and stronger health threat awareness can strengthen consumers' preference for sustainable and health-positioned foods, thereby

increasing the likelihood of actual consumption behavior (Liang et al., 2024; Madureira et al., 2025). Similarly, research linking environmental and health threat perceptions to green purchasing suggests that when individuals perceive greater susceptibility to harm and greater severity of outcomes, they become more motivated to engage in protective consumption practices (He et al., 2025; Mastria et al., 2023). In the green food domain, susceptibility and severity beliefs can thus act as motivational forces that encourage consumers to replace unhealthy options with certified green food choices.

Taken together, these HBM belief components are expected to exert direct effects on green food consumption behavior by jointly shaping consumers' value appraisal, constraint appraisal, and threat appraisal. Therefore, this study proposes the following hypotheses:

H5a: Perceived benefits positively influence green food consumption behavior.

H5b: Perceived barriers negatively influence green food consumption behavior.

H5c: Perceived susceptibility positively influences green food consumption behavior.

H5d: Perceived severity positively influences green food consumption behavior.

Perceived benefits provide a central evaluative channel through which knowledge is converted into green food consumption behavior (Chen et al., 2025). In food decisions that rely heavily on information interpretation, consumers are more likely to act when knowledge makes the advantages of a product category easier to recognize, justify, and internalize. Evidence from innovative and sustainability oriented food contexts indicates that greater information exposure and stronger knowledge are associated with more favorable evaluations and stronger purchasing responses, largely because the perceived advantages become clearer and more persuasive to consumers (Eisend & Tarrahi, 2022; Lei et al., 2023). Related findings also suggest that objective knowledge can improve benefit appraisal by supporting more accurate interpretation of product claims and standards, while subjective knowledge can increase benefit salience by strengthening confidence in one's understanding and reducing hesitation in evaluating product value (Raju et al., 1995).

Once benefit perceptions are strengthened, consumers' likelihood of adopting green food consumption increases. Perceived benefits have repeatedly been identified as a strong behavioral driver in green and health oriented consumption because consumers are more willing to purchase and maintain consumption when they expect tangible gains in quality, safety, and health related outcomes (Gomes et al., 2023) (Lopes et al., 2024). This pattern indicates that the influence of knowledge is often realized through an evaluative process in which knowledge enhances perceived advantages, and those perceived advantages subsequently motivate actual consumption behavior.

Accordingly, the present study expects perceived benefits to mediate the effects of both objective knowledge and subjective knowledge on green food consumption behavior. Therefore, this study proposes the following hypotheses:

H6a: Perceived benefits mediate the relationship between objective knowledge and green food consumption behavior.

H6b: Perceived benefits mediate the relationship between subjective knowledge and green food consumption behavior.

Perceived barriers refer to consumers' perceived obstacles that hinder them from purchasing and consuming green food, such as price concerns, limited availability, inconvenience, uncertainty about authenticity, and difficulty interpreting certification information (Nichifor et al., 2025). In sustainable consumption contexts, barrier perceptions are widely recognized as a central explanation for why pro green awareness and positive evaluations do not consistently translate into actual behavior. When consumers perceive obstacles as substantial, they are less likely to adopt green food even if they acknowledge its value, which makes perceived barriers a critical psychological mechanism linking upstream cognition to downstream consumption behavior (Amicarelli et al., 2022).

Knowledge is expected to shape green food behavior partly by altering how barriers are perceived. Objective knowledge provides factual clarity about certification standards, product attributes, and evaluation criteria, which can reduce uncertainty and correct misconceptions, thereby weakening barrier salience. Evidence from health and safety related decision contexts suggests that higher objective knowledge is associated with lower perceived barriers because individuals are better able to judge feasibility and navigate complex information (Bhuller et al., 2024). Subjective knowledge may operate

through a complementary route. When consumers feel knowledgeable, they often experience greater decision confidence and perceived capability, which reduces hesitation and makes barriers appear more manageable. Health belief research indicates that barrier perceptions decline when individuals believe they are sufficiently equipped to take an action and are less overwhelmed by informational and practical constraints (Denovan et al., 2024; Vincenzo et al., 2022).

At the outcome level, perceived barriers tend to exert a direct negative effect on green consumption behavior because they raise the perceived cost of action and restrict behavioral enactment. Even consumers with favorable evaluations may avoid sustainable purchases when perceived obstacles remain high, reinforcing the role of barriers as a key inhibitor of green food adoption. Taken together, these findings support a mediating pathway in which both objective knowledge and subjective knowledge increase green food consumption behavior by reducing perceived barriers, with objective knowledge improving factual evaluative accuracy and subjective knowledge strengthening confidence to overcome obstacles. Therefore, this study proposes the following hypotheses:

H7a: Perceived barriers mediate the relationship between objective knowledge and green food consumption behavior.

H7b: Perceived barriers mediate the relationship between subjective knowledge and green food consumption behavior.

Perceived susceptibility refers to consumers' belief about the likelihood that they or their family may experience negative health outcomes as a result of unhealthy or non green food consumption. Higher susceptibility typically increases motivation to adopt protective choices, because consumers who feel more vulnerable are more likely to replace risky options with foods perceived as safer and healthier. Evidence from health belief research shows that knowledge is a consistent antecedent of susceptibility appraisal. When individuals understand risk mechanisms and exposure pathways more clearly, they tend to judge their vulnerability as higher, which then supports preventive action. Studies in public health contexts report that stronger knowledge predicts higher perceived susceptibility and greater willingness to adopt protective behaviors (Barattucci et al., 2022; Zewdie et al., 2022). Similar patterns are reported in community risk research, where increased knowledge of risk factors strengthens susceptibility perceptions and encourages preventive orientations (Akokuwebe & Idemudia, 2022).

In food and sustainability related decisions, susceptibility functions as a cognitive bridge that helps convert knowledge into action. When consumers perceive themselves as vulnerable to the harms associated with unhealthy food, they become more responsive to health and safety information and more likely to adopt sustainable and health oriented consumption practices. Research on green consumption indicates that risk perception and vulnerability appraisal can promote eco friendly behavior and strengthen the translation of cognition into behavior in sustainable purchasing settings (Shehawy & Khan, 2024; Xie et al., 2022). In addition, susceptibility can be shaped by both factual understanding and perceived understanding. Objective knowledge clarifies what the risks are and why they matter. Subjective knowledge strengthens confidence and personal relevance in risk evaluation, which can intensify vulnerability appraisal. Evidence from environmental hazard studies suggests that individuals who perceive themselves as knowledgeable may report stronger risk related perceptions, implying that perceived understanding can heighten susceptibility rather than reduce it (Imran et al., 2025).

Accordingly, objective knowledge and subjective knowledge are expected to increase green food consumption behavior partly through perceived susceptibility, because knowledge based vulnerability appraisal motivates consumers to adopt protective consumption choices. Therefore, this study proposes the following hypotheses:

H8a: Perceived susceptibility mediates the relationship between objective knowledge and green food consumption behavior.

H8b: Perceived susceptibility mediates the relationship between subjective knowledge and green food consumption behavior.

Perceived severity refers to consumers' appraisal of how serious the consequences of unhealthy or non green food consumption may be, including potential long term health damage and broader negative outcomes for well being (Nong et al., 2022). In health belief reasoning, severity is a key motivational belief because protective behavior becomes more likely when individuals judge a threat as serious and consequential. In food consumption contexts, severity beliefs can therefore strengthen consumers' motivation to avoid risky options and to adopt alternatives perceived as healthier and safer.

Knowledge is expected to shape green food consumption partly by strengthening severity appraisal. Objective knowledge provides factual understanding of food related risks, health mechanisms, and the implications of unhealthy consumption, which can

increase consumers' perceived seriousness of the threat. Evidence from public health contexts indicates that higher knowledge levels are associated with stronger severity perceptions, as individuals who better understand a threat tend to judge its consequences as more serious and requiring preventive action (Balla & Hagger, 2025; Chadi et al., 2022). Extended health belief applications also show that objective knowledge can predict perceived severity alongside other belief components, reinforcing the role of factual understanding in threat appraisal processes (Sarwar et al., 2023). Subjective knowledge can contribute through a complementary route. When consumers feel knowledgeable, they often process health information with greater certainty and personal relevance, which can intensify perceived seriousness. Research on risk perception suggests that perceived understanding can influence how strongly individuals evaluate the seriousness of negative outcomes, especially when knowledge confidence shapes the interpretation of hazard information (Goebel & Wardropper, 2024). These findings imply that objective knowledge and subjective knowledge can both elevate perceived severity, which then motivates protective consumption choices.

Once perceived severity increases, consumers become more likely to adopt behaviors that reduce exposure to the perceived threat. In the green food context, stronger severity beliefs regarding the consequences of unhealthy food consumption should increase the motivation to choose certified green food as a preventive and health oriented option. Accordingly, perceived severity is expected to function as a mediating mechanism that converts knowledge into green food consumption behavior. Therefore, this study proposes the following hypotheses:

H9a: Perceived severity mediates the relationship between objective knowledge and consumption behavior toward green food.

H9b: Perceived severity mediates the relationship between subjective knowledge and consumption behavior toward green food.

Cues to action refers to the internal or external triggers that prompt a consumer to move from awareness and evaluation to actual purchase and consumption, such as health related symptoms, advice from doctors or nutrition professionals, reminders from family and peers, media reports about food safety incidents, and repeated exposure to credible green food promotion messages (Adiman et al., 2024).

Within the Health Belief Model, these cues function as immediate activation signals that increase behavioral readiness, especially when consumers already recognize meaningful benefits and risks but still need a concrete prompt to act. Empirical evidence across food and health oriented consumption consistently shows that cues to action can significantly strengthen healthy and sustainable dietary choices, including greater likelihood of consuming nutrient rich foods and other health oriented products (Glick et al., 2024), as well as preventive health behaviors in real world settings where reminders and information exposure directly stimulate action (Mirakzadeh et al., 2021).

In organic and green food contexts, cues to action have also been found to be a salient predictor of organic food purchase intention during the COVID 19 period, highlighting the activating role of media cues, social reminders, and health related prompts in motivating consumers to choose safer and more sustainable food options (Alagarsamy et al., 2022). Recent consumer behavior evidence further emphasizes that public health messaging and social influence often operate as cues to action that encourage consumers to engage in health seeking and food choice behaviors (Khan et al., 2022). Although some studies report that cues to action may become less influential when other drivers such as attitude or perceived benefits dominate the decision process (Helinski & Schewe, 2022; Tian et al., 2024), the overall theoretical and empirical logic supports expecting that stronger cues to action will increase the likelihood of green food consumption in contexts where safety, health, and credibility cues are highly salient. Therefore, this study proposes:

H10: Cues to action positively influence green food consumption behavior toward green food.

Table 2.5 summarises the hypotheses proposed in this study.

Table 2.6 Hypothesis Table

Hypothesis	Hypothesis Statement
H1	Consumers with higher levels of objective knowledge about green food are more likely to engage in green food consumption behavior.
H2	Consumers with higher levels of subjective knowledge regarding green food are more inclined to perform green food consumption behavior.
H3a	Subjective knowledge positively influences perceived benefits of green food.

Table 2.6 (continued)

Hypothesis	Hypothesis Statement
H3b	Subjective knowledge negatively influences perceived barriers to green food consumption.
H3c	Subjective knowledge positively influences perceived susceptibility to risks associated with non-green food.
H3d	Subjective knowledge positively influences perceived severity of the consequences of unhealthy food consumption.
H4a	Objective knowledge positively influences perceived benefits of green food.
H4b	Objective knowledge negatively influences perceived barriers to green food consumption.
H4c	Objective knowledge positively influences perceived susceptibility to risks linked to unhealthy food consumption.
H4d	Objective knowledge positively influences perceived severity of the consequences of unhealthy food consumption.
H5a	Perceived benefits positively influence green food consumption behavior.
H5b	Perceived barriers negatively influence green food consumption behavior.
H5c	Perceived susceptibility positively influences green food consumption behavior.
H5d	Perceived severity positively influences green food consumption behavior.
H6a	Perceived benefits mediate the relationship between objective knowledge and green food consumption behavior.
H6b	Perceived benefits mediate the relationship between subjective knowledge and green food consumption behavior.
H7a	Perceived barriers mediate the relationship between objective knowledge and green food consumption behavior.
H7b	Perceived barriers mediate the relationship between subjective knowledge and green food consumption behavior.

Table 2.6 (continued)

Hypothesis	Hypothesis Statement
H8a	Perceived susceptibility mediates the relationship between objective knowledge and green food consumption behavior.
H8b	Perceived susceptibility mediates the relationship between subjective knowledge and green food consumption behavior.
H9a	Perceived severity mediates the relationship between objective knowledge and green food consumption behavior.
H9b	Perceived severity mediates the relationship between subjective knowledge and green food consumption behavior.
H10	Cues to action positively influence green food consumption behavior toward green food.

2.5 Conclusion

This chapter primarily introduced the definition of green food, the current state of research on green food consumption, the research status of consumer food knowledge, and the characteristics of Chinese female consumers. It subsequently reviewed the application of the knowledge attitude behavior (KAB) model and the health belief model (HBM) in the food consumption field and defined the variables influencing green food consumption behavior under these models. Finally, based on the KAB model and HBM, this chapter constructed a research model for green food consumption behavior among Chinese female and proposed the corresponding research hypotheses. This chapter provides the theoretical foundation for the entire study. The next chapter will introduce the research methods.

CHAPTER 3
METHODOLOGY

This chapter provides a comprehensive overview of the research methods used in this study, including research design, data collection strategies, data analysis techniques, the target population and sample size. Finally, the chapter discusses the ethical considerations adopted in this research.

3.1 Overview and Justification of Research Paradigm

Positivism is a research philosophy that asserts that the only authentic knowledge is that which is based on actual sensory experience and positive verification (Mohammad Ali, 2024). This approach relies on observable, empirical evidence, and typically employs scientific methods to collect data and test hypotheses. Positivists believe that reality exists objectively and independently of human perception, and that knowledge can be accumulated through systematic observation, measurement, and experimentation (Park et al., 2020). This philosophy advocates for a detached and neutral stance, ensuring that the research remains value-free and unbiased.

3.1.1 Ontology

From the ontological perspective of positivism, the factors influencing consumer behavior are considered objective realities that exist independently of those who perceive them (Lim, 2023). These factors, including knowledge, attitudes, and health beliefs, represent measurable constructs that can be systematically quantified and empirically analyzed. Chinese females' green food consumption behavior is thus viewed as a phenomenon that may be observed and analyzed, rather than being shaped by subjective experience or perception (Peng, 2023).

3.1.2 Epistemology

Epistemologically, this study, under the positivist paradigm, seeks to acquire knowledge from empirical evidence. This involves identifying and measuring the relationships between various factors and Chinese females' consumption behaviors. Data

are collected through structured questionnaires, enabling the study to provide objective evidence for statistical testing and verification (Tepavčević et al., 2025). This empirical approach ensures that the generated knowledge is based on observable phenomena and can be generalized to a broader population, thereby contributing to a scientific understanding of green food consumption behavior.

3.1.3 Methodology

Within this positivist research, the methodological approach involves the use of structured questionnaires to collect quantitative data from Chinese females (Wang et al., 2024). This method allows for the systematic collection of information that can be analyzed using statistical techniques. Methods such as regression analysis, factor analysis, and structural equation modeling will be employed to identify patterns and test hypotheses regarding the factors influencing green food consumption behavior (Qi & Ploeger, 2021). This rigorous methodological framework ensures the reliability, validity, and replicability of the findings, providing a solid foundation for drawing generalizable conclusions.

3.1.4 Axiology

Positivist research strives to maintain a value-free approach and uphold objectivity throughout the entire research process (Park et al., 2020). Researchers ensure that personal biases and values do not influence data collection or analysis. By adopting a detached and neutral position, the study aims to generate unbiased and impartial results based on empirical evidence (Carichon et al., 2024). This commitment to objectivity enhances the credibility and reliability of the findings, which can be used to inform strategies aimed at promoting green food consumption behavior .

By adopting the positivist approach, this study emphasizes the objective measurement and analysis of factors influencing green food consumption behavior among Chinese females through empirical data. This approach allows for the development of evidence-based, generalizable conclusions, contributing to a broader understanding of green food consumption (Stozhko & Ergunova, 2022). Insights gained from this research can inform the development of effective strategies to enhance green food consumption among Chinese female, thereby supporting the further growth of this sector.

3.2 Research Tool

This study employs quantitative analysis methods, integrating the knowledge attitude behavior model with the health belief model to construct a multidimensional theoretical framework, providing a new perspective for understanding and analyzing green food consumption behavior. Building on this foundation, the study identifies that subjective knowledge and objective knowledge, as independent variables, can influence health beliefs (perceived benefits, perceived barriers, perceived susceptibility, and perceived severity) as mediating variables, while also directly affecting consumption behavior toward green food and outcomes.

The theoretical framework developed in this study aims to systematically analyze the dynamic relationships between subjective knowledge, objective knowledge, and the four dimensions of health beliefs (encompassing perceived benefits, perceived barriers, perceived susceptibility, and perceived severity) in relation to green food consumption behavior among Chinese female. Furthermore, it seeks to reveal how these cognitive factors drive practical applications in the field of green food consumption through consumption behavior.

The framework includes a series of meticulously designed scales, each specifically tailored to measure the relevant constructs central to the research focus. The operational definitions of the variables in this study will be elaborated in detail in the following sections.

3.2.1 Operational Definitions of Variables

To ensure the rigor and clarity of this research, operational definitions for key variables in the survey are provided as follows:

Table 3.1 Operational Definitions of Related Variables

Variables	Definition	Sources
Subjective Knowledge of Green Food	Consumers' perceived understanding of information about green food products.	Fatha and Ayoubi (2023)

Table 3.1 (continued)

Variables	Definition	Sources
Objective Knowledge of Green Food	What consumers actually know about green food (Planting method , Environmental Impact , Management and Certification , Components.).	Fatha and Ayoubi (2023)
Cue to Action	The external informational and social stimuli that activate an individual's motivation to purchase green food	Abigail A Glick et al. (2024)
Perceived Benefits	Consumers' beliefs about the health and environmental benefits green food can offer.	Martey (2024)
Perceived Barriers	Consumers' beliefs about the psychological, availability, and actual cost barriers to consuming green food.	Martey (2025)
Perceived Susceptibility	Consumers' subjective assessment of the health risks (e.g., pesticide residues, additives) posed by non-green food.	Wang et al. (2024)
Perceived Severity	Consumers' concerns about the potential health threats caused by foodborne diseases.	Wang et al. (2021)
Consumption Behavior toward Green Food	Consumers' consistent actions of purchasing, selecting, and recommending food products carrying green food certification labels.	Zhu et al. (2013)

3.2.2 Measurement of Variables

The research model includes independent variables (subjective knowledge of green food, objective knowledge of green food), a dependent variable (green food consumption behavior), mediating variables (perceived benefits, perceived barriers, perceived susceptibility, perceived severity). All variables in the model are latent and primarily measured through the design of corresponding scales. These scales are mainly adapted

from well-established scales published in authoritative academic journals, with appropriate modifications made to improve their reliability and validity.

To facilitate respondent understanding and improve the accuracy of data collection, the scale design adhered to principles such as presenting simple questions before more complex ones and using clear academic language. Subsequently, relevant experts were invited to provide feedback on the developed scales, and necessary revisions were made to the questionnaire. The following section introduces the measurement scales for each variable used in this study.

3.2.2.1 Subjective Knowledge of Green Food

Subjective Knowledge of Green Food refers to consumers' perceived understanding of information related to green food products. The measurement for this study drew on the knowledge sharing behavior scale developed by Fatha and Ayoubi (2023), including three dimensions and three items. To ensure reliability and validity, a seven-point Likert scale was employed. Details are as follows:

Table 3.2 Measurement Scale of Subjective Knowledge of Green Food

Variables	Original Items	Revised Items	Sources
Subjective Knowledge of Green Food	1:In comparison with an average person I know a lot about organic food	SK1: In comparison with an other person (who has no professional background in food/nutrition). I know a lot about green food	Fatha and Ayoubi (2023)
	2:I know a lot about how to judge the quality of organic food	SK2: I know a lot about how to judge the quality of green food	
	3:People who know me consider me as an expert in the field of organic food	SK3: People who know me consider me as an expert in the field of green food	

3.2.2.2 Objective Knowledge of Green Food

Objective knowledge of green food refers to the extent to which Chinese female consumers hold accurate and verifiable information regarding green food production requirements, core attributes, certification related characteristics, and definitional boundaries. Consistent with the measurement logic proposed by Fatha and Ayoubi (2023), this study operationalized objective knowledge using factual knowledge statements adapted to the green food context. To maintain a consistent response format across the questionnaire, each statement was rated on a 7 point Likert scale ranging from strongly disagree to strongly agree, where responses indicate both endorsement of the factual content and the respondent's certainty.

To ensure that the construct captures knowledge accuracy rather than attitudinal preference, the items were scored based on their correctness direction. For statements that are factually consistent with the green food definition adopted in this study, higher agreement indicates higher objective knowledge, whereas any statements framed in the opposite direction were reverse scored so that higher values consistently represent greater objective knowledge. An overall objective knowledge score was then computed by aggregating the five items. This approach reduces random guessing compared with forced choice formats and allows objective knowledge to be distinguished conceptually from subjective knowledge, which reflects perceived familiarity rather than factual endorsement.

Table 3.3 Measurement Scale of Objective Knowledge of Green Food

Variables	Original Items	Revised Items	Sources
Objective Knowledge of Green Food	1:Organic food is grown without the use of synthetic pesticides and chemical fertilizers.	OK1:Green food is produced by using minimal synthetic pesticides and chemical fertilizers.	Fatha and Ayoubi (2023)
	2:Organic food is environmentally friendly.	OK2:Green food is environmentally friendly.	

Table 3.3 (continued)

Variables	Original Items	Revised Items	Sources
	3:Organic farming is the same as natural/traditional farming.	OK3: Green farming is the same as natural/traditional farming.	
	4:Organic farming has strictly controlled production systems.	OK4: Green farming has strictly controlled production systems.	
	5:Organic food doesn't contain Genetically Modified Organisms (GMOs).	OK5: Green food doesn't contain Genetically Modified Organisms (GMOs).	

3.2.2.3 Cues to Action

Cues to Action refers to the external informational and social stimuli that activate an individual's motivation to purchase green food. This study employs the measurement approach proposed by Abigail A Glick et al. (2024). To evaluate respondents' cues to action regarding green food, a scoring-based categorization method was utilized., encompassing three dimensions and three items. To guarantee data reliability and validity, a seven-point Likert scale was implemented for evaluation. The specifics are as follows:

Table 3.4 Measurement Scale of Cues to Action

Variables	Original Items	Revised Items	Sources
Cues to Action	1:I would pay more attention to the quality of my food choices : if recommended by a doctor or medical professional.	CA1:I would be more willing to purchase green food if it were recommended by a food expert or nutritionist.	Abigail A Glick et al. (2024)

Table 3.4 (continued)

Variables	Original Items	Revised Items	Sources
	2:I would pay more attention to the quality of my food choices : if my friends or family members mentioned it.	CA2:I would be more willing to purchase green food if my friends or family members mentioned it.	
	3:I would pay more attention to the quality of my food choices : if I read information in the mass media.	CA3: I would be more willing to purchase green food if it were recommended by KOLs (Key Opinion Leaders) or influencers on social media.	

3.2.2.4 Consumption Behavior toward Green Food

Consumption behavior toward green food refers to consumers' actual purchasing actions concerning foods with green food certification labels. This variable reflects consumers' purchase intentions and actions, motivated by their beliefs in the health and environmental benefits offered by green food. The measurement approach is adopted from Zhu et al. (2013), including four dimensions and four items. To ensure data reliability and validity, a seven-point Likert scale is used for evaluation. Details are as follows:

Table 3.5 Measurement Scale of Green Food Consumption Behavior

Variables	Original Items	Revised Items	Sources
Green Food Consumption Behavior	1:I always buy green food.	GCB1: I always buy green food.	Zhu et al. (2013)
	2:I always try to find with green labeling marks.	GCB2: I always try to find food with green labeling marks.	
	3:I buy green food even with higher prices.	GCB3: I buy green food even with higher prices.	

Table 3.5 (continued)

Variables	Original Items	Revised Items	Sources
	4:I recommend green food that I consumed to my relatives and friends.	GCB4: I recommend green food that I consumed to my relatives and friends.	

3.2.2.5 Perceived Benefits

Perceived Benefits refers to consumers' beliefs about the health and environmental advantages provided by green food. This study adopts Martey (2024)'s measurement approach for perceived benefits regarding organic food consumption, which includes seven dimensions with a total of eight items. A seven-point Likert scale is employed to ensure data reliability and validity. The details are as follows:

Table 3.6 Measurement Scale of Perceived Benefits

Variables	Original Items	Revised Items	Sources
Perceived Benefits	1:I believe green food is beneficial to my health.	PB1: I believe green food is beneficial to my health.	Martey (2024)
	2:I believe green food prevents diseases.	PB2: I believe green food prevents diseases.	
	3:It is a good decision to buy green food.	PB3: It is a good decision to buy green food.	
	4:The labelling of green helps me make good choices.	PB4: The labelling of green helps me make good choices.	
	5:I believe that eating green food is good for my health.	PB5: I believe that eating green food is good for my health.	
	6:Green food is one of the most essential things for my health.	PB6: Green food is one of the most essential things for my health.	

3.2.2.6 Perceived Barriers

Perceived Barriers refers to consumers' beliefs about psychological, accessibility, and actual cost obstacles to consuming green food. This study adopts Martey (2025)'s method for measuring perceived barriers, which consists of five items assessed on a seven-point Likert scale to guarantee reliability and validity. The details are as follows:

Table 3.7 Measurement Scale of Perceived Barriers

Variables	Original Items	Revised Items	Sources
Perceived Barriers	1:I have no control over the food to eat at home.	PBA1: I have no control over the food to eat at home	Martey (2025)
	2:I have no idea of how much food I should eat.	PBA2: I have no idea of how much food I should eat	
	3:I do not know the kind of food that is healthy for me.	PBA3: I do not know the kind of food that is healthy for me.	
	4:It is hard to find time to eat healthy food.	PBA4: It is hard to find time to eat healthy food.	
	5:I find it difficult to choose green foods with family/friends.	PBA5: I find it difficult to choose green foods when with family/friends.	

3.2.2.7 Perceived Susceptibility

Perceived Susceptibility is defined as consumers' subjective assessment of potential health risks (e.g., pesticide residues, additives) stemming from buying non-green food. This research adopts Wang et al. (2024)'s scale, originally designed for organic beef consumption scenarios and comprising three items, all rated on a seven-point Likert scale. Details are as follows:

Table 3.8 Measurement Scale of Perceived Susceptibility

Variables	Original Items	Revised Items	Sources
Perceived Susceptibility	1:The novel coronavirus has been detected in beef, I worried about buying infected beef.	PS1: I am worried about buying food products that might be contaminated with harmful substances.	Wang et al. (2024)
	2:Due to food safety issues, I am concerned about purchasing beef with veterinary drug residues.	PS2: Due to food safety issues, I am concerned about purchasing food with chemical residues.	
	3:I worried that consuming infected beef poses a threat to health.	PS3: I worry that consuming problematic food poses a threat to my health.	

3.2.2.8 Perceived Severity

Perceived Severity refers to consumers' concerns about the potential health threats caused by foodborne diseases. This study adopts the measurement approach proposed by Wang et al. (2021), who examined perceived severity in the context of food handling behaviors. Four items were developed to measure perceived severity using a seven-point Likert scale, with higher scores indicating greater perceived severity of foodborne diseases. The details are as follows:

Table 3.9 Measurement Scale of Perceived Severity

Variables	Original Items	Revised Items	Sources
Perceived Severity	1:Foodborne diseases will have a negative effect on my health.	PSV1: Foodborne diseases will have a negative effect on my health.	Wang et al. (2021)
	2:Foodborne diseases will make me feel bad.	PSV2:Foodborne diseases will make me feel bad.	

Table 3.9 (continued)

Variables	Original Items	Revised Items	Sources
	3:Foodborne diseases will have a negative influence on my family life.	PSV3: Foodborne diseases will have a negative influence on my family life.	
	4:Foodborne diseases will have a negative influence on my work.	PSV4: Foodborne diseases will have a negative influence on my work.	

3.2.3 Questionnaire Design

This study employed a questionnaire survey method to collect data for validating the conceptual model. To ensure respondents' understanding of the concept of green food, the questionnaire began with relevant explanations. The first section gathered participants' basic demographic information. The second section focused on respondents' purchasing behaviors regarding green food. The third section consisted of measurement scales, comprising 7 variables and 34 questions, with the detailed questionnaire provided in Appendix 1. A seven-point Likert scale was used for measurement: 1 indicating "strongly disagree," 2 "disagree," 3 "slightly disagree," 4 "neutral," 5 "slightly agree," 6 "agree," and 7 "strongly agree."

The questionnaire primarily included the following sections:

(1) Questionnaire Instructions: This section covered the purpose and significance of the survey, completion guidelines, and privacy assurances. Special emphasis was placed on the confidentiality of questionnaire content and personal information to gain respondents' trust and cooperation, ensuring fairness and objectivity while maintaining the reliability and validity of the questionnaire.

(2) Basic Information: This section aimed to collect fundamental information about survey participants. Given that female's purchasing behaviors toward green food may be influenced by subjective factors, the questionnaire included detailed information such as education level, income, and marital status to support data description and analysis. These factors were further analyzed to understand their impact on green food purchase intentions. This section contained five questions.

(3) Consumer Purchasing Behavior and Perception of Green Food: This section explored the current purchasing status of green food among Chinese female consumers. Screening questions were designed, first inquiring about respondents' gender and whether they had ever purchased or were interested in purchasing green food. Male respondents or those who had never purchased and had no intention to purchase were directed to skip to the final section, while targeted respondents proceeded to the subsequent parts of the questionnaire.

(4) Measurement Scales: The core section of the questionnaire included objective and subjective questions. These questions were designed based on specific variables identified in the research model, totaling 33 questions.

3.3 Data Collection Administration

3.3.1 Target Population

During the questionnaire design phase, the target respondents for this study were defined as female residents aged 20–60, currently living in Beijing, and with prior experience in purchasing green food.

According to the Seventh National Population Census (2020), the total population of females aged 20–60 residing in Beijing is 6,888,943. This figure represents the complete, unambiguous target population frame of the present study. Despite the availability of this clear population frame, a probability sampling method (such as simple random sampling or stratified random sampling) was not feasible for this study. The key constraint lies in the absence of a sampling frame—that is, a complete, accessible list of all individuals within this population who also meet the critical behavioral criterion of “having prior experience in purchasing green food.” The national census data provides demographic totals but does not contain information on individuals’ green food consumption behaviors. Therefore, it was impossible to directly and randomly select individuals from the 6.88 million who are known to be eligible for the study.

Table 3.10 Distribution for Beijing Women Aged 20-60

Age (Years)	Group Population (Persons)	Population Share (%)
20–29	1,543,295	22.40
30–39	2,228,889	32.35
40–49	1,539,926	22.36
50–60	1,576,833	22.89
Total	6,888,943	100.00

Source: The 7th National Population Census Data,2020

(1) The basis for selecting women aged 20 - 60 as the target group

Women aged 20-60 are in the most active stage of consumption behavior, with stable economic resources and strong consumption decision-making power, making them one of the core groups in the current urban consumer market (Liu, 2023). Relevant studies have indicated that women in this age group exhibit high consumption frequency and strong participation in multiple fields such as clothing, cosmetics, daily necessities, health, and education, thus serving as key subjects for research on brand marketing and consumer psychology (Liu, 2023). Furthermore, this population shows a high sensitive to brand image, consumption experience, and social communication, making them more representative of modern urban consumption trends (Boardman & McCormick, 2023).

Meanwhile, to ensure the consistency of the target population and the scientific validity of the research results, this study excludes female groups under 20 and over 60 years old. Women under 20 are mostly in the student stage, with insufficient economic independence; their consumption behaviors are often heavily influenced by family, lacking typical characteristics of independent consumption. In contrast, due to physiological and psychological changes, women over 60 have significantly different consumption demands, channel preferences, and behavioral patterns from the mainstream market, and it is suggested that they be studied as an independent group in specialized research (Meneely et al., 2009; Mumel & Završnik, 2007).

(2) Advantages of Selecting Beijing as Research Location

Beijing leads the nation in market maturity. As China's political, economic, and cultural center, Beijing has the most well-developed green food market (Xie et al., 2025).

The supply chain system is comprehensive, consumers have the most abundant opportunities and channels to access green food, providing an ideal research environment.

Policy environment and institutional guarantees are comprehensive. As the center of policy formulation and implementation, Beijing plays a national demonstration role in food safety supervision and green certification systems, providing a comprehensive institutional environment and quality assurance for green food consumption (Wang et al., 2022).

Consumption capacity and concepts are mature. Beijing residents have strong consumption capacity and relatively mature consumption concepts, with high awareness and acceptance of green food, providing sufficient sample diversity and representativeness for research (Chai et al., 2022).

Furthermore, Beijing demonstrates strong supply and demand dynamics in the green food market.Its green food sales consistently rank among the top two in the nation. These advantages position Beijing not only as an ideal site for research on sustainable consumption but also as a model city whose practices can inform other urban centers across China.

(3) Special Value of Beijing Female Population

Education level is the highest nationally with outstanding rational consumption capacity. According to the Seventh National Population Census data, 52.8% of Beijing women aged 20-60 hold bachelor's degrees or above, with 18.3% holding graduate degrees or above, far exceeding the national average (National Bureau of Statistics, 2021). Highly educated Beijing women have stronger understanding abilities regarding food labels, certification systems, and health information, enabling rational green food consumption decisions.

Income level ranks among the top with sufficient payment capacity. In 2024, the per capita disposable income of urban women in Beijing reached 94,200 yuan, ranking among the top nationally (Beijing Bureau of Statistics, 2024). Sufficient economic foundation enables Beijing women to have the capacity to pay premiums for green food, truly reflecting consumers' green consumption preferences under economically unconstrained conditions.

Information acquisition channels are diversified with advanced consumption concepts. Beijing women access rich green food information through digital platforms and

offline channels, with high levels of understanding regarding international organic standards and sustainable development concepts. Meanwhile, social networks are active, with word-of-mouth communication playing important roles in consumption decision-making.

Family decision-making influence is significant. Research shows that food purchasing decisions in Beijing households are dominated or deeply participated in by women (Liu, 2023). This characteristic makes studying Beijing women's green food consumption behavior of important practical guidance significance.

Environmental consciousness and social responsibility are strong. As capital residents, Beijing women have higher sensitivity to environmental protection and food safety issues, being more likely to accept environmental concepts. Research indicates that Beijing female consumers consider environmental factors in purchasing decisions, significantly higher than other cities (Liu & Niyongira, 2017).

3.3.2 Sampling Methods

This study adopted a sampling method combining purposive sampling and quota sampling to ensure the representativeness of the sample and the operability of data collection.

Purposive sampling was applied to ensure that all respondents strictly met pre-determined eligibility criteria, so that the sample directly matched the theoretical and empirical requirements of this research. Quota sampling was further used to match the age distribution of the target population, enhancing the representativeness and external validity of the sample.

The selection of sampling methods mainly considered the research objectives and practical constraints. Although the distribution data of Beijing's population came from the seventh national population census, this study adopted a non-probability sampling method. Since this study mainly explores the relationship between variables, the structural representativeness of the sample is more important than strict probability representativeness. The target population - "Beijing women with green food consumption experience (age 20-60)" - lacks a complete list of individuals, making it difficult to establish a random sampling framework. Therefore, combining purposeful sampling with quota sampling provided a suitable and methodologically reliable alternative. Through purposeful sampling, we were able to screen specific consumer groups, while quota

sampling ensured the apparent representativeness of the sample structure and reduced the selection bias that might arise from relying solely on convenience sampling (Yang & Banamah, 2014).

(1) Quota sampling design

This study uses age as the variable for quota setting, primarily considering significant differences in green food consumption behaviors among women of different age groups. Based on the distribution data of women aged 20-60 in Beijing from the 'Seventh National Population Census,' quotas for each age group were proportionally designed to ensure the sample structure is largely consistent with the overall distribution. This age range covers the main consumer groups of green food, providing a sufficient data foundation for comparative analysis of different consumption patterns.

(2) Application of Purposive Sampling

Within each age quota group, this study adopted a purposeful sampling method to specifically select respondents who meet certain criteria. The samples were contacted through various channels (onsite) and operated according to the specific implementation methods of the data collection section. To ensure sample quality, strict screening criteria were established: respondents must be women aged 20-60, reside in Beijing, and have experience in purchasing green food.

The questionnaire was conducted using the Questionnaire Star platform (Wenjuanxing, also known as "Questionnaire Star"), a widely used onsite survey tool in China with an intuitive interface and powerful data management capabilities. The platform helped monitor the progress of sample collection in real-time and set quotas for each age group, automatically controlling the number of samples. To ensure data quality, the platform also implemented mechanisms such as logical consistency checks, response time control, and prevention of duplicate submissions.

The sampling procedure was as follows:

Step 1: Define the target population.

The study targeted female consumers aged 20 to 60 who reside in Beijing, with particular attention to those who had purchased green food products.

Step 2: Plan the sample size and quota allocation.

Based on the Seventh National Population Census data for Beijing, divide the target population into age-based strata. Allocate sample quotas proportionally according

to the age distribution of 20-60 year-old females in Beijing to ensure demographic representativeness. The age quota sampling distribution is presented in Table 3.10.

Step 3: Implement convenience sampling within each age quota.

Within each age stratum, employ convenience sampling through offline locations to recruit respondents who meet the screening criteria. Monitor quota fulfillment in real-time to ensure the final sample structure aligns with the predetermined age distribution while maintaining data collection efficiency and feasibility.

3.3.3 Sample Size

For structural equation modeling (SEM) analysis, the minimum sample size requirement is typically between 100 and 150 participants (Lakens, 2022). However, to ensure robust model estimation and sufficient statistical power, a commonly recommended approach is to use a sample size-to-item ratio of 10:1. Given that the questionnaire used in this study includes 8 variables and 33 items in total, the minimum required sample size is 330 (10×33=330) to meet this ratio.A total of 676 valid responses were retained after data cleaning (e.g., completeness checks and removal of invalid cases) and were used for subsequent SEM analyses, which exceeded the minimum requirement and ensured adequate statistical power.

3.3.4 Data Collection Methods

The data collection was conducted over a one-month period from October to November 2025, utilizing field research across four representative types of consumer venues in Beijing to ensure diverse coverage of target populations.

Specifically, large chain supermarkets (e.g., Carrefour, Walmart, Hualian) were selected as primary sites, with surveys conducted mainly on weekday afternoons and weekends to focus on female consumers purchasing or browsing organic and green food. Community fresh markets were surveyed during peak hours (9:30–11:30 a.m.), a time when consumers prioritizing food freshness and safety are most active. Organic food specialty stores, including high-end supermarkets (Ole, BHG, Sam's Club) and dedicated organic chains, were included to capture respondents with strong green consumption awareness and purchasing power. Additionally, surveys in shopping mall food courts and health food retail areas were scheduled primarily on weekends to reach family shopping groups.

The research team consisted of professionally trained researchers and research assistants, all of whom completed standardized pre-survey training. This training covered in-depth comprehension of questionnaire content, precise alignment with research objectives, strict adherence to academic ethics, and mastery of effective communication skills—measures designed to ensure the standardization and scientific rigor of data collection.

Field data collection was conducted through one-on-one data collection. Investigators first used brief screening questions to verify that potential respondents met the study's criteria: women aged 20–60, Beijing residents, and with prior experience purchasing green food. Eligible respondents received detailed explanations of the research purpose, the voluntary nature of participation, and data confidentiality protocols. Upon obtaining explicit consent, respondents were guided to complete an electronic questionnaire via the Wenjuanxing platform. Investigators remained present throughout to provide necessary clarifications, ensuring accurate understanding of each item and minimizing measurement errors due to misinterpretation. Respondents could either use their own smartphones to scan a QR code or complete the questionnaire using tablets provided by the research team.

To ensure the accuracy and rigor of the bilingual (English/Chinese) questionnaire, a translation and back-translation process was applied. The original questionnaire, developed in English, was translated into Chinese by bilingual researchers. Following this, the Chinese version was independently translated back into English by a second bilingual researcher. The two English versions were compared to ensure that the meaning and intent of the items were preserved. Any discrepancies identified during this process were discussed and resolved between the researchers to ensure the linguistic and conceptual equivalence of both versions. This procedure helped to ensure that the translated questionnaire was both reliable and valid for the Chinese-speaking respondents.

To acknowledge respondents' time investment and enhance participation motivation, each completed questionnaire was followed by a moderately valued gift. These gifts, primarily practical daily necessities or green food trial packs related to the research theme, not only expressed respect for participants but also reinforced the relevance of the study's focus.

3.4 Data Analysis

3.4.1 Pre-test

A the pre-test phase, a total of 35 valid questionnaires were obtained. Following methodological guidance that pilot testing for initial instrument development commonly uses approximately 10–30 participants and that around 30 is a reasonable minimum, a pre-test with 35 valid questionnaires was conducted (Johanson & Brooks, 2010). Valid responses were strictly defined as those completed by female residents aged 20–60 who currently live in Beijing and have prior experience purchasing green food, while all questionnaires that did not satisfy these criteria were excluded from the dataset. On this basis, an initial examination of the psychometric quality of the instrument was conducted, focusing in particular on the reliability and validity of the measurement scales. The procedures and empirical results of these evaluations are reported in the following subsections.

3.4.1.1 Reliability Analysis

As shown in Table 3.11, the pre-test results indicate that all constructs exhibit satisfactory internal consistency reliability. Cronbach's α values range from 0.780 to 0.927, exceeding the commonly accepted minimum threshold of 0.70, which is generally regarded as indicative of acceptable reliability for social science research instruments. Cronbach's α reflects the degree to which items within the same construct are intercorrelated and thus measure the same underlying latent concept; higher coefficients signal greater homogeneity among items and lower random measurement error. In this study, each construct—subjective knowledge, objective knowledge, green food consumption behavior, perceived benefits, perceived barriers, perceived susceptibility, perceived severity, and cues to action—demonstrates α coefficients within the "good" (≥0.80) to "excellent" (≥0.90) range, with the exception of perceived susceptibility, which still falls within the acceptable range and therefore does not raise concerns about measurement instability (Wang et al., 2023). Overall the measurement instrument possesses robust internal consistency and is suitable for subsequent large-scale data collection and hypothesis testing.

Table 3.11 Pretest Reliability Statistics

Study variables	Number of questions	Cronbach's α
Subjective Knowledge	3	0.836
Objective Knowledge	5	0.899
Green Food Consumption Behavior	4	0.890
Perceived Benefits	6	0.927
Perceived Barriers	5	0.912
Perceived Susceptibility	3	0.780
Perceived Severity	3	0.875
Cues to Action	3	0.873

3.4.2.2 Validity Analysis

As presented in Table 3.12, the Kaiser–Meyer–Olkin (KMO) statistics for all constructs fall within the acceptable range, demonstrating that the measurement items possess adequate sampling adequacy for factor analysis. The KMO coefficient evaluates the proportion of variance among observed variables that may be attributed to underlying common factors; values closer to 1 indicate that the correlation patterns are compact and therefore suitable for extraction of distinct latent constructs. Specifically, above 0.7 is acceptable, reflecting that the partial correlations among items are sufficiently low and that the covariance structure is appropriate for exploring the latent dimensions of each variable. In this pre-test, subjective knowledge (KMO = 0.706), perceived susceptibility (KMO = 0.710), perceived severity (KMO = 0.705), and cues to action (KMO = 0.713) all meet the acceptable threshold, suggesting that even constructs with fewer items possess adequate underlying cohesion for factor-based validation. Further examination of the remaining constructs reveals even stronger evidence of validity. Objective knowledge (KMO = 0.862), green food consumption behavior (KMO = 0.890), perceived benefits (KMO = 0.892), and perceived barriers (KMO = 0.897) exhibit coefficients approaching the “excellent” range, indicating that the inter-item correlations are well-structured for subsequent confirmatory analyses (Wang et al., 2023).

Table 3.12 Pre-investigation KMO

Study variables	Number of questions	KMO
Subjective Knowledge	3	0.706
Objective Knowledge	5	0.862
Green Food Consumption Behavior	4	0.890
Perceived Benefits	6	0.892
Perceived Barriers	5	0.897
Perceived Susceptibility	3	0.710
Perceived Severity	3	0.705
Cues to Action	3	0.713

3.4.2 Descriptive Statistical Analysis

In this study, respondents'basic demographic characteristics were collected, including age, educational attainment, occupation type, marital status, monthly household income, parental status, number of children, and whether any household members have special dietary needs. These variables help construct a comprehensive sociodemographic profile of the target population and provide a foundation for subsequent subgroup comparisons and moderation analyses.

During the data analysis phase, descriptive statistics—including frequencies and percentages—will be used to summarize the distribution of demographic variables and present the overall sample structure. To explore whether green food consumption behaviors differ significantly across population subgroups (e.g., by age, education level, or parenting status), appropriate inferential statistical tests will be conducted.

Prior to group comparisons, normality assumptions of the relevant variables will be assessed using the Shapiro–Wilk test. If the data meet normality assumptions, parametric tests such as independent-samples t-tests and one-way ANOVA will be employed.

3.4.3 Structural Equation Modeling (SEM)

Structural Equation Modeling (SEM) is a comprehensive multivariate statistical technique that explores possible causal relationships between variables by constructing models and estimating parameters. SEM involves two types of variables: observed (manifest) variables and latent variables. It integrates multiple statistical techniques,

including analysis of variance, factor analysis, path analysis, and correlation analysis (Hair Jr et al., 2014). The SEM framework consists of the measurement model, which focuses on the relationships between observed indicators and latent variables, and the structural model, which examines the interactions among latent variables. Compared to traditional regression analysis, SEM can simultaneously handle multiple variables and clarify complex relationships among them, offering in-depth analytical and interpretive power for empirical research.

Based on the survey data, this research employs AMOS software to construct a structural equation model for green food consumption behavior among Chinese females. The study fits and analyzes the influence of various factors from multiple dimensions and conducts path analyses to verify the effects of key variables. The model is used to test the hypotheses proposed in this research and to investigate the impact of different variables on the green food consumption behavior of Chinese females.

Confirmatory Factor Analysis (CFA) is commonly conducted to determine whether the latent factors included within the scale are consistent with the hypothesized structure. In this study, CFA is incorporated into the SEM process to verify whether the collected data fit the predefined factor structure. During model estimation, SEM automatically performs CFA, allowing simultaneous assessment of both the measurement and structural models (Hair et al., 2014). This integrated approach helps confirm the validity of the measurement model before testing the hypothesized relationships among latent variables.

The reliability and validity of the constructs are evaluated using two key indices: Composite Reliability (CR) and Average Variance Extracted (AVE). A CR above 0.7 indicates consistent measurement of latent constructs, while an AVE above 0.5 suggests good convergent validity (Shrestha, 2021).

Determining the goodness-of-fit of the structural equation model is vital for assessing the consistency between the theoretical model and the actual data (Hooper et al., 2007). Multiple fit indices are used in this study, including chi-square to degrees of freedom ratio (χ^2/df), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normed fit index (NFI), comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA) (Bentler, 1990; Hair et al., 2011). The recommended cut-off values are shown in Table 3.10. A model is considered a good fit if

χ^2/df is less than 3, RMSEA is less than 0.08, and GFI, AGFI, NFI, TLI, and CFI each exceed 0.9.

Table 3.13 Fit Indices of Structural Equation Models

Fit Index	Criteria	Reference
χ^2/df	<3	Hooper et al. (2007)
Goodness of Fit Index (GFI)	>0.9	Hooper et al. (2007)
Adjusted GFI (AGFI)	>0.9	MacCallum and Hong (1997)
RMSEA	<0.08	Hooper et al. (2007)
NFI	>0.9	Bentler (1990)
PNFI	>0.9	Bentler (1990)
CFI	>0.9	Bentler (1990)
NNFI (TLI)	>0.9	Bentler and Bonett (1980)

After confirming good model fit, path analysis is conducted to estimate path coefficients and test their significance. Path analysis examines hypothesized relationships among latent variables by estimating and evaluating the significance of standardized path coefficients, t-values, and p-values. A p-value less than 0.05 (or 0.01) indicates statistical significance.

Direct effect analysis assesses the direct impact of independent variables on dependent variables. Indirect effect analysis investigates whether an effect is transmitted via a mediating variable, often tested using both the product of coefficients and the Bootstrap method to determine the significance of mediation paths.

These analyses enable researchers to interpret findings with greater confidence, providing a strong foundation for examining the impact of knowledge on Chinese female's green food consumption behavior.

3.5 Ethical Consideration

Ethics and morality comprise the principles guiding interpersonal interactions and moral judgments. In academic research, ethical and moral considerations ensure that no individual is harmed or subjected to adverse consequences during the research process (Chaddha & Agrawal, 2023). This study focuses on the following ethical issues: informed

consent, privacy and confidentiality, the right to refuse participation, research risks, and data protection.

(1) Informed Consent: Before participation, detailed research information is provided to prospective participants to obtain their informed consent. Respondents are informed of the reason for their selection, the study's purpose, procedures, and any potential risks. Comprehensive explanations are presented at the beginning of onsite surveys, ensuring participants have all necessary information to give truly informed consent.

(2) Privacy and Confidentiality: Participants' privacy will be strictly respected. Measures will be taken to ensure confidentiality, and personal data will not be disclosed.

(3) Right to Refuse Participation: Participants may freely decide whether to participate or not, without any external pressure or inducement. As all surveys are paperless and conducted on-site, participants may make their decision immediately at the scene and may withdraw from the survey at any time during the process without any penalty.

(4) Research Risks: No foreseeable risks are anticipated in this study. Participants are only required to focus on completing the questionnaire. If discomfort or adverse reactions occur, professional counseling resources will be provided.

(5) Data Protection: Researchers are responsible for ensuring data security and confidentiality. Paper-based questionnaires will be secured in a locked cabinet at the researcher's office, while electronic data collected online will be stored in encrypted USB drives kept in a secure location. Only researchers have access to the data, and all necessary precautions will be taken to prevent loss or misuse.

3.6 Conclusion

This chapter has presented the methodological foundation of the study and explained how the research was designed to examine the determinants of green food consumption behavior among Chinese female consumers in Beijing. Section 3.1 justified the adoption of a positivist research paradigm and clarified the study's ontological, epistemological, methodological, and axiological positions, emphasizing objective measurement, empirical testing, and value neutral analysis as the guiding principles for hypothesis verification.

Section 3.2 then outlined the research tool and operationalized the key constructs in the integrated framework, specifying how subjective knowledge, objective knowledge, cues to action, perceived benefits, perceived barriers, perceived susceptibility, perceived severity, and green food consumption behavior were defined and measured. This section also detailed the measurement development and adaptation process, including the use of established scales, the objective knowledge scoring approach, and the seven point Likert format used for the latent variables. Section 3.2.3 further described the overall questionnaire structure and sequencing logic, ensuring conceptual clarity for respondents and improving data quality through clear instructions, demographic profiling, screening questions, and a structured measurement section.

Section 3.3 described the data collection administration, including the definition and justification of the target population, the rationale for selecting Beijing as the research setting, and the sampling logic that combined purposive sampling with quota sampling to improve feasibility while maintaining a reasonable demographic structure. It also explained the field implementation procedures, including site selection across multiple consumer venues, eligibility screening, bilingual translation and back translation procedures, and standardized training for researchers and research assistants to ensure consistent administration. Section 3.4 summarized the planned data analysis strategy, beginning with instrument pre testing and preliminary reliability and validity checks, followed by descriptive and group comparison analyses, and concluding with structural equation modeling using AMOS, including confirmatory factor analysis, construct reliability and validity assessment, model fit evaluation, and hypothesis testing for direct and indirect effects. Section 3.5 concluded the chapter by outlining the ethical safeguards adopted in the study, including informed consent, confidentiality, voluntary participation, minimal risk management, and secure data protection arrangements.

Overall, Chapter Three establishes a coherent and replicable methodological pathway that links the theoretical model to measurable constructs, systematic data collection, and rigorous statistical testing. On this basis, the next chapter reports the empirical results derived from the formal dataset and evaluates the proposed hypotheses through the specified analytical procedures.

CHAPTER 4
RESULTS

This chapter presents the empirical results derived from the questionnaire survey, offering a systematic account of the sample characteristics, the descriptive profile of the key measurement variables, and the subsequent assessment of data adequacy before advancing to the evaluation of the proposed theoretical model. The analysis draws on statistical procedures conducted through AMOS and SPSS, allowing for a rigorous examination of the measurement properties and the structural relationships among the core constructs. The chapter begins by outlining the demographic composition of the respondents and the distributional features of the principal variables. It then examines the reliability and validity of the measurement instrument to ensure that the data meet the necessary psychometric standards for subsequent modeling. Building on this foundation, the chapter assesses the structural equation model and evaluates the structural linkages specified in the conceptual framework, including both the primary pathways and the role of control variables.

4.1 Descriptive Analysis

4.1.1 Sample Characteristics

In total, 676 valid questionnaires were obtained after applying strict screening criteria, as shown in Table 4.1. Valid cases were defined as female residents of Beijing aged 20–60 who had prior experience purchasing green food; questionnaires that did not meet these requirements were excluded from the analysis. In terms of cognitive familiarity, the sample displays a relatively high level of self-reported awareness of green food: 14.9% indicated having heard of green food but not understanding it, 26.0% reported knowing “a little” about it, 27.7% stated that they knew it “fairly well,” and 31.4% reported that they understood it “very well.” The age structure is broadly distributed across the target range, with 27.1% aged 20–29, 27.7% aged 30–39, 31.5% aged 40–49, and 13.8% aged 50–60, indicating a sample that is slightly concentrated in middle adulthood but still inclusive of younger and older female consumers.

A predominantly middle- to upper-middle-income profile is observed when monthly per capita family income is considered. The largest group falls in the 8,001–10,000 RMB range (24.3%), followed by 10,001–15,000 RMB (18.6%), 15,001–20,000 RMB (18.0%), and 20,001–30,000 RMB (10.9%), while only 1.9% report 2,001–4,000 RMB and 6.4% exceed 30,000 RMB. This distribution suggests that the sample is composed mainly of consumers with relatively stable and moderate-to-high purchasing power, which is consistent with the positioning of green food as a higher-value product. In terms of education, 12.0% have junior high school education or below, 38.6% have completed high school, 33.1% hold a bachelor's degree, and 16.3% possess a master's degree or above, indicating that a substantial proportion has at least upper secondary education and more than one-third has higher education.

Marital status is also diverse, with nearly half of respondents being married (49.3%), while 25.4% are single, 11.7% are divorced, and 13.6% are widowed, reflecting heterogeneous family structures and potential differences in household decision-making patterns related to food consumption.

Table 4.1 Sample Information

Information and Options		**Frequency**	**Percent (%)**
Have you heard of green food before	Yes, but I don't understand it	101	14.9
	Yes, and I know a little about it	176	26
	Yes, and I know it fairly well	187	27.7
	Yes, and I understand it very well	212	31.4
Age	20–29	183	27.1
	30–39	187	27.7
	40–49	212	31.4
	50–60	94	13.9
Average Monthly Income (RMB)	2,001–4,000	13	1.9
	4,001–6,000	82	12.1
	6,001–8,000	52	7.7
	8,001–10,000	164	24.3
	10,001–15,000	126	18.6
	15,001–20,000	122	18
	20,001–30,000	74	10.9
	Above 30,000	43	6.4

Table 4.1 (continued)

Information and Options		Frequency	Percent (%)
Education Level	Junior high school or below	81	12
	High school	261	38.6
	Bachelor's degree	224	33.1
	Master's degree or above	110	16.3
Marital Status	Single	172	25.4
	Married	333	49.3
	Divorced	79	11.7
	Widowed	92	13.6

As illustrated in Figure 4.1, consumers rely on a diverse mix of digital and offline channels to obtain information about green food, with algorithm-driven short-video platforms emerging as the most prominent source. The distribution highlights the centrality of social media ecosystems in shaping awareness, while more traditional channels such as supermarkets, interpersonal communication, and television continue to play a complementary role. These patterns align with the descriptive statistics presented earlier and provide empirical support for the argument that contemporary green-food communication is embedded in a hybrid information environment.

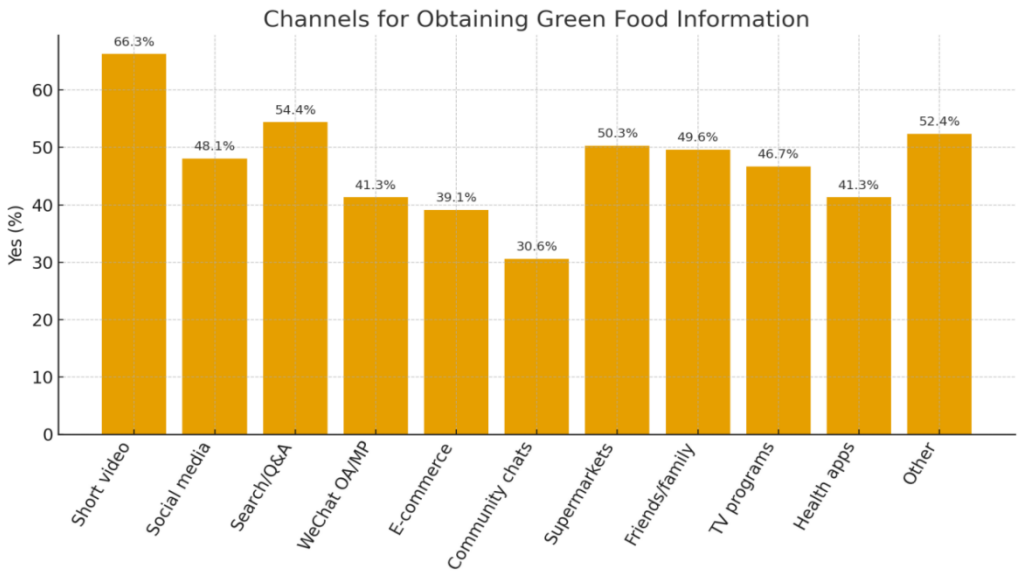

Figure 4.1 Distribution of Information Channels Used by Consumers to Learn About Green Food

As shown in Figure 4.2, daily household consumption represents the predominant motivation for purchasing green food, accounting for more than sixty percent of respondents. This suggests that green food is primarily embedded in routine dietary practices rather than occasional or symbolic consumption. Gift-giving and dual-purpose purchasing constitute smaller proportions, indicating that although green food carries social and symbolic value, its core function remains tied to everyday health-oriented food choices. This distribution aligns with the broader consumption patterns observed in the sample and reinforces the centrality of personal and family health needs in shaping green-food demand.

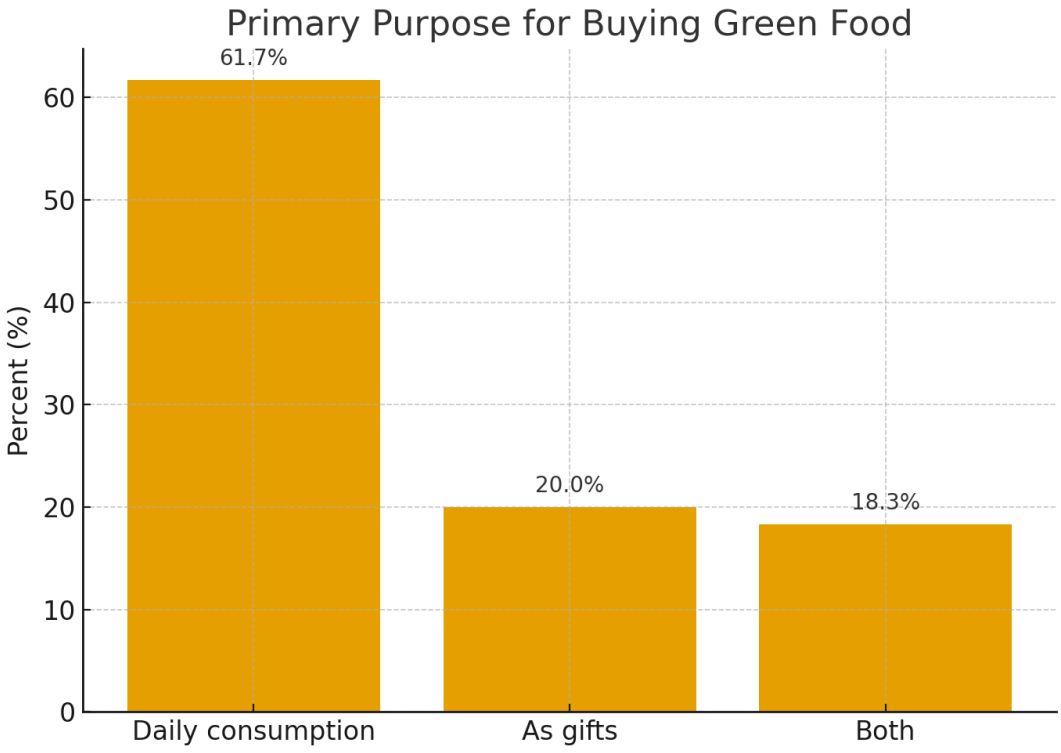

Figure 4.2 Primary Purpose for Purchasing Green Food Among Consumers

As indicated in Figure 4.3, consumption of green food is predominantly shared across multiple household members, with nearly seventy percent of respondents reporting a mixed-consumption pattern. This finding reinforces the family-centered nature of green-food purchasing, suggesting that buying decisions are rarely made for a single individual but instead serve broader household nutritional needs. Only a small proportion of respondents identified themselves, their spouses or parents, or their children as the exclusive consumers. This distribution underscores the embeddedness of green food

within collective eating practices and highlights the importance of household-level perspectives when examining consumer behavior in the green-food domain.

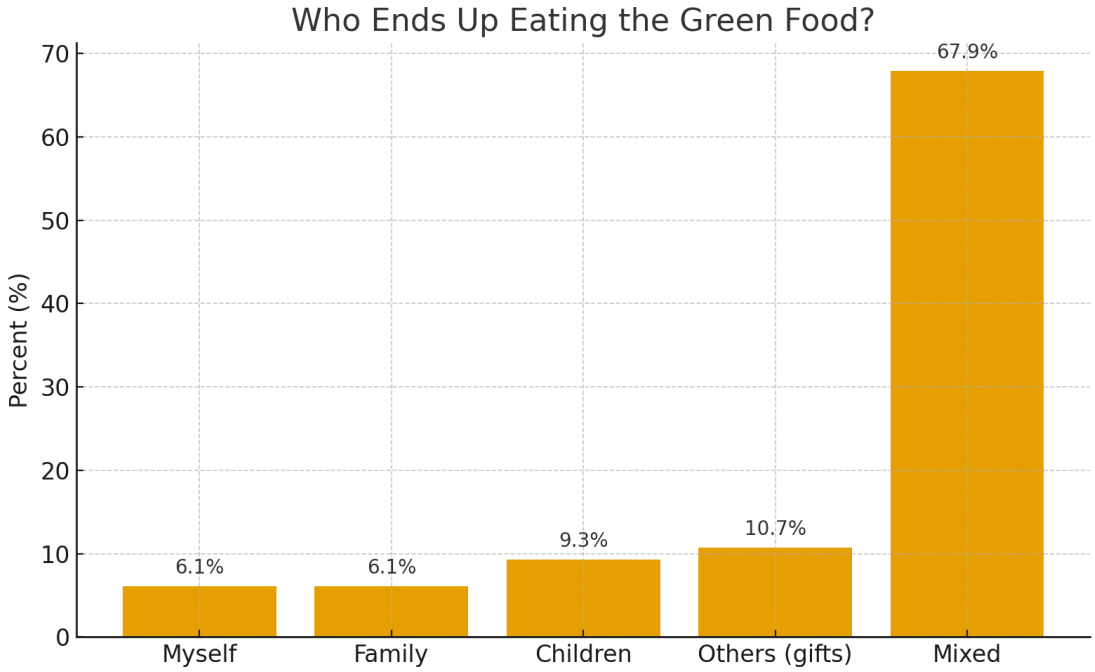

Figure 4.3 Distribution of Consumers Who Ultimately Eat the Green Food

As illustrated in Figure 4.4, health-related considerations overwhelmingly dominate consumers' decision-making, with nearly ninety percent selecting "healthier" as a primary factor. Taste and nutritional value also rank prominently, indicating that sensory quality and perceived functional benefits are central to consumers' evaluations of green food. By contrast, price sensitivity and environmental concerns play comparatively minor roles, suggesting that green-food purchasing is driven more by personal and family wellbeing than by cost or ecological motivations. These findings complement the behavioral patterns observed earlier and highlight the health-centric value framework underlying green-food consumption.

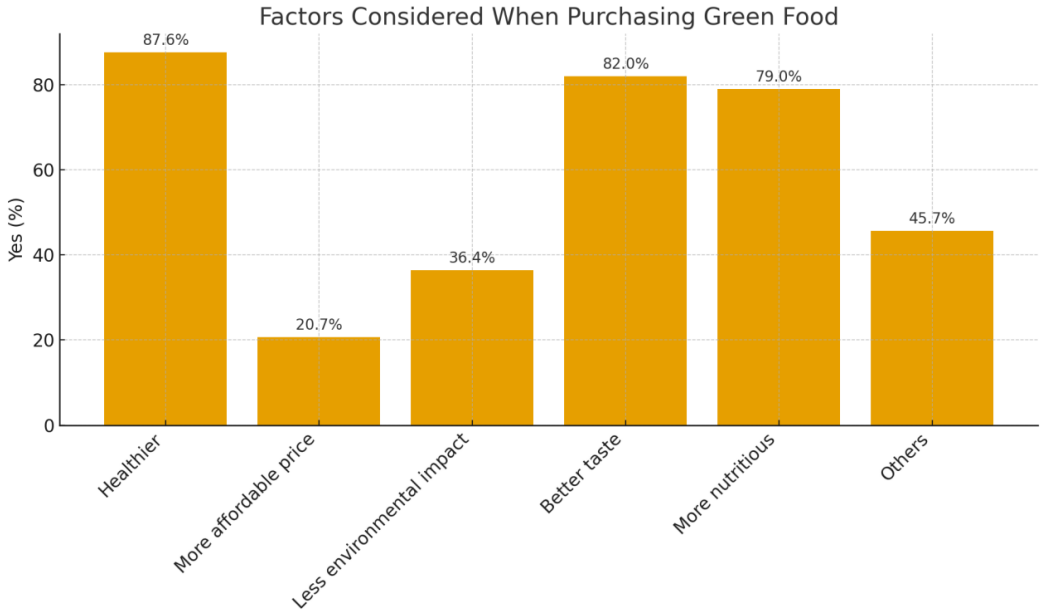

Figure 4.4 Key Factors Considered by Consumers When Purchasing Green Food

4.1.2 Descriptive Statistics

As reported in Table 4.2, the descriptive statistics indicate that respondents generally exhibit relatively high levels of subjective knowledge, objective knowledge, green food consumption behavior, perceived benefits, perceived susceptibility, perceived severity, and cues to action, with item means concentrated around 4.45–4.62 on the response scale. In contrast, the means for perceived barriers range from 3.38 to 3.50, suggesting that perceived obstacles to purchasing green food are closer to the scale midpoint and notably lower than the other constructs, implying comparatively weaker barrier perceptions. The mean represents the central tendency of responses to each item, reflecting the overall level of agreement or endorsement in the sample, whereas the standard deviation (S.D.) captures the degree of dispersion around this mean. Standard deviations are generally around 1.35–1.52 for most items, indicating a moderate spread of responses, with sufficient variability for subsequent multivariate analyses while still reflecting a relatively consistent pattern of attitudes and behaviors within the sample.

The skewness and kurtosis values in Table 4.2 further characterize the distributional properties of the observed variables. Skewness measures the asymmetry of the distribution around the mean; negative skewness values observed for most items (typically between approximately −0.70 and −0.97) denote a left-skewed distribution, indicating that a larger proportion of respondents chose higher response categories,

consistent with the relatively high means for knowledge, behavior, perceived benefits, susceptibility, severity, and cues to action. By contrast, the perceived barrier items display positive skewness (around 0.72–0.87), suggesting a right-skewed distribution in which lower response categories are more frequently selected, again aligning with their lower means. Kurtosis indexes the "peakedness" and tail heaviness of the distribution relative to a normal distribution (kurtosis ≈ 0). The kurtosis values in Table 4.2 mostly range from about −0.58 to approximately 0.05, indicating distributions that are close to normal or slightly platykurtic (flatter than normal) with no serious tail problems. Together with the associated standard errors (S.E.) for skewness and kurtosis, these results suggest that the item distributions do not substantially deviate from the assumptions of normality typically required for structural equation modeling, and that the data are statistically suitable for subsequent reliability, validity, and model estimation procedures.

Table 4.2 Descriptive Statistics Results

Study variables	Items	Mean	S.D.	Skewness		Kurtosis	
				Value	S.E.	Value	S.E.
Subjective Knowledge	SK1	4.560	1.454	-0.918	0.126	-0.013	0.251
	SK2	4.530	1.420	-0.844	0.126	-0.251	0.251
	SK3	4.570	1.358	-0.896	0.126	-0.065	0.251
Objective Knowledge	OK1	4.540	1.434	-0.879	0.126	-0.363	0.251
	OK2	4.470	1.447	-0.822	0.126	-0.263	0.251
	OK3	4.520	1.438	-0.835	0.126	-0.271	0.251
	OK4	4.490	1.427	-0.966	0.126	0.029	0.251
	OK5	4.530	1.406	-0.910	0.126	-0.102	0.251
Green Food	GCB1	4.460	1.494	-0.752	0.126	-0.464	0.251
Consumption	GCB2	4.570	1.382	-0.839	0.126	-0.089	0.251
Behavior	GCB3	4.530	1.418	-0.839	0.126	-0.218	0.251
	GCB4	4.540	1.395	-0.758	0.126	-0.491	0.251
Perceived Benefits	PB1	4.510	1.468	-0.700	0.126	-0.496	0.251
	PB2	4.580	1.436	-0.859	0.126	-0.108	0.251
	PB3	4.520	1.401	-0.843	0.126	-0.088	0.251
	PB4	4.540	1.438	-0.721	0.126	-0.493	0.251

Table 4.2 (continued)

Study variables	Items	Mean	S.D.	Skewness		Kurtosis	
				Value	S.E.	Value	S.E.
	PB5	4.530	1.460	-0.711	0.126	-0.578	0.251
	PB6	4.500	1.444	-0.849	0.126	-0.197	0.251
Perceived Barriers	PBA1	3.490	1.414	0.738	0.126	-0.406	0.251
	PBA2	3.380	1.439	0.792	0.126	-0.298	0.251
	PBA3	3.500	1.380	0.717	0.126	-0.454	0.251
	PBA4	3.490	1.410	0.842	0.126	-0.302	0.251
	PBA5	3.430	1.403	0.868	0.126	-0.227	0.251
Perceived	PS1	4.530	1.525	-0.803	0.126	-0.274	0.251
Susceptibility	PS2	4.530	1.372	-0.847	0.126	-0.168	0.251
	PS3	4.540	1.414	-0.890	0.126	-0.154	0.251
Perceived Severity	PSV1	4.500	1.431	-0.831	0.126	-0.308	0.251
	PSV2	4.450	1.494	-0.761	0.126	-0.395	0.251
	PSV3	4.530	1.433	-0.809	0.126	-0.333	0.251
Cues to Action	CA1	4.540	1.373	-0.956	0.126	0.050	0.251
	CA2	4.620	1.398	-0.972	0.126	-0.012	0.251
	CA3	4.530	1.462	-0.856	0.126	-0.373	0.251

4.2 Structural Equation Model

Structural Equation Modeling (SEM) was employed to examine the latent constructs and the hypothesized causal relationships among them, drawing on the covariance structure of the observed variables to evaluate both the measurement properties and the structural pathways of the proposed model. As a comprehensive analytical framework that integrates factor analysis and path analysis, SEM enables the simultaneous assessment of latent variable reliability, construct validity, and the directional influences posited in the theoretical framework. Following the logic of a posteriori model testing, an a priori network of relationships was specified on the basis of established theoretical and empirical findings, after which the overall model fit and the statistical significance of individual paths were evaluated. Through its dual components—the measurement model, which assesses the adequacy of indicator–construct relationships, and the structural model,

which estimates the causal linkages among latent variables—SEM provides a rigorous methodological foundation for analyzing complex multivariate relationships within the dataset.

4.2.1 Confirmatory Factor Analysis

4.2.1.1 Measurement Model and Fit Metrics

Figure 4.5 presents the standardized measurement model estimated in AMOS, illustrating the relationships between each latent construct and its corresponding observed indicators. All constructs—subjective knowledge, objective knowledge, green food consumption behavior, perceived benefits, perceived barriers, perceived susceptibility, perceived severity, and cues to action—are modeled as latent variables represented by ellipses, each measured by multiple observed items shown as rectangles. The standardized factor loadings displayed along the paths from latent variables to their indicators are uniformly high (mostly above 0.70), demonstrating strong item–construct correspondence and providing evidence of convergent validity. The residual terms associated with each indicator reflect the proportion of variance not explained by the latent constructs, and their moderate magnitudes indicate acceptable levels of measurement error. The covariance paths linking the latent factors capture the interrelationships among the constructs, with the numerical estimates signifying the degree of association implied by the data.

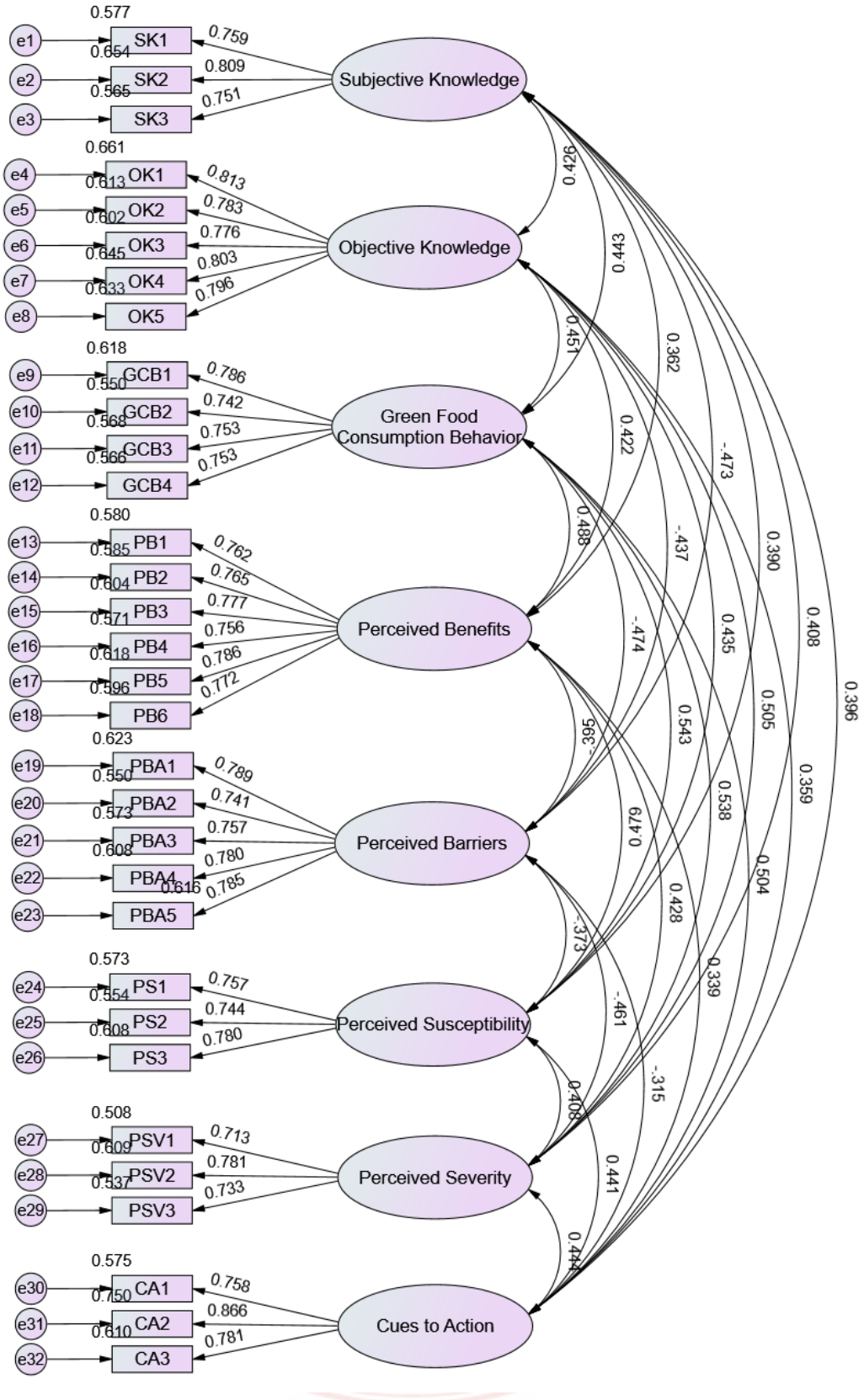

Figure 4.5 Measurement model in AMOS

As shown in Table 4.3, the overall measurement model demonstrates an excellent level of fit across all reported indices, indicating that the hypothesized latent structure is highly consistent with the observed data. The χ^2/df ratio is 1.056, well below the conventional threshold of 3, suggesting minimal discrepancy between the model-implied and empirical covariance matrices. The RMSEA value of 0.012 further reinforces this conclusion; RMSEA values below 0.08 are generally regarded as acceptable, and values approaching zero indicate a model with very limited approximation error. These indicators collectively signal that the model achieves a high degree of parsimony without compromising explanatory adequacy. The comparative and incremental fit indices also reveal consistently strong performance. The GFI (0.931) and AGFI (0.916) both surpass the accepted criterion of 0.90, indicating that a substantial proportion of the observed covariance is reproduced by the model. Similarly, the NFI (0.929), TLI (0.995), and CFI (0.996) exceed the recommended threshold of 0.90, with the TLI and CFI approaching unity—a level typically associated with exceptionally well-fitting models (Fang et al., 2022).

Table 4.3 Measure Model Fit Metrics

Fit index	χ2/df	RMSEA	GFI	AGFI	NFI	TLI	CFI
Reference standards	<3	<0.08	>0.9	>0.9	>0.9	>0.9	>0.9
Result	1.056	0.012	0.931	0.916	0.929	0.995	0.996

4.2.1.2 Convergent Validity

As reported in Table 4.4, the measurement model demonstrates satisfactory convergent validity for all latent constructs. In confirmatory factor analysis, factor loadings represent the strength of the association between each observed indicator and its underlying latent variable, with higher values indicating that an item captures more of the variance of the construct it is intended to measure. Across all eight constructs, standardized factor loadings range from 0.713 to 0.866, exceeding the commonly cited minimum threshold of 0.70 and thus indicating that each indicator contributes substantially to its respective factor. This pattern suggests that the observed variables provide a coherent and empirically well-supported representation of the latent dimensions of subjective

knowledge, objective knowledge, green food consumption behavior, perceived benefits, perceived barriers, perceived susceptibility, perceived severity, and cues to action. Convergent validity was further evaluated using composite reliability (CR) and average variance extracted (AVE), which jointly assess the internal consistency and explanatory power of the latent constructs. CR reflects the overall reliability of a construct by summarizing the shared variance among its indicators; values above 0.70 are generally regarded as acceptable. AVE quantifies the average proportion of variance in the indicators that is accounted for by the latent construct, with values above 0.50 indicating that the construct explains more variance in its indicators than is due to measurement error. These results confirm that each construct exhibits both high internal consistency and adequate explanatory power (Cheung et al., 2024).

Table 4.4 Convergence Validity

Latent variables	Observation indicators	Factor loading	CR	AVE
Subjective Knowledge	SK1	0.759	0.817	0.598
	SK2	0.809		
	SK3	0.751		
Objective Knowledge	OK1	0.813	0.895	0.631
	OK2	0.783		
	OK3	0.776		
	OK4	0.803		
	OK5	0.796		
Green Food Consumption Behavior	GCB1	0.786	0.844	0.576
	GCB2	0.742		
	GCB3	0.753		
	GCB4	0.753		
Perceived Benefits	PB1	0.762	0.897	0.593
	PB2	0.765		
	PB3	0.777		
	PB4	0.756		
	PB5	0.786		
	PB6	0.772		

Table 4.4 (continued)

Latent variables	Observation indicators	Factor loading	CR	AVE
Perceived Barriers	PBA1	0.789	0.880	0.594
	PBA2	0.741		
	PBA3	0.757		
	PBA4	0.780		
	PBA5	0.785		
Perceived Susceptibility	PS1	0.757	0.804	0.578
	PS2	0.744		
	PS3	0.780		
Perceived Severity	PSV1	0.713	0.787	0.552
	PSV2	0.781		
	PSV3	0.733		
Cues to Action	CA1	0.758	0.845	0.645
	CA2	0.866		
	CA3	0.781		

4.2.1.3 Discriminant Validity

As shown in Table 4.5, discriminant validity was assessed using the Fornell–Larcker criterion, in which the square root of the average variance extracted (AVE) for each latent construct appears on the main diagonal and the inter-construct correlation coefficients appear off the diagonal (Fornell & Larcker, 1981). The diagonal elements (ranging from 0.743 to 0.803) represent the extent to which each construct shares variance with its own indicators, while the off-diagonal elements indicate the degree of association between different constructs. To establish discriminant validity, the square root of the AVE of a given construct should be greater than the absolute value of its correlation coefficient with all other constructs. This condition is satisfied for all variables—Subjective Knowledge (SK), Objective Knowledge (OK), Green Food Consumption Behavior (GCB), Perceived Benefits (PB), Perceived Barriers (PBA), Perceived Susceptibility (PS), Perceived Severity (PSV) and Cues to Action (CA)—demonstrating that each latent

variable has a stronger relationship with its own measurement items than with other constructs in the model. All correlations are statistically significant at the 0.001 level ($p < 0.001$), indicating that the observed associations are unlikely to be due to sampling error. These results confirm that the measurement model achieves satisfactory discriminant validity, with each construct empirically distinguishable yet systematically related to the others in a theoretically coherent manner (Rönkkö & Cho, 2022).

Table 4.5 Discriminant Validity Test

Latent variables	SK	OK	GCB	PB	PBA	PS	PSV	CA
Subjective Knowledge	0.773***							
Objective Knowledge	0.426	0.794***						
Green Food Consumption Behavior	0.443	0.451	0.759***					
Perceived Benefits	0.362	0.422	0.488	0.770***				
Perceived Barriers	-0.473	-0.437	-0.474	-0.395	0.771***			
Perceived Susceptibility	0.390	0.435	0.543	0.479	-0.373	0.760***		
Perceived Severity	0.408	0.505	0.538	0.428	-0.461	0.408	0.743***	
Cues to Action	0.396	0.359	0.504	0.339	-0.315	0.441	0.444	0.803***

Note: The diagonal is the square root of the corresponding dimension AVE

SK: Subjective Knowledge; OK: Objective Knowledge; GCB: Green Food Consumption Behavior; PB: Perceived Benefits; PBA: Perceived Barriers; PS: Perceived Susceptibility; PSV: Perceived Severity; CA: Cues to Action.

***: P<0.001.

4.2.2 Structural Model Path Analysis

4.2.2.1 Model Fit Metrics for the Structural Model

As reported in Table 4.6, the structural model exhibits an overall fit that meets, and in several cases surpasses, commonly accepted benchmarks in structural equation modeling. The χ^2/df ratio is 1.221, which is well below the conventional threshold

of 3, indicating that the discrepancy between the model-implied and observed covariance matrices is minimal and that the model attains an appropriate balance between goodness of fit and parsimony. The RMSEA value of 0.024 is substantially lower than the recommended upper limit of 0.08, suggesting very small approximation error in reproducing the population covariance structure. The incremental and absolute fit indices further confirm the adequacy of the structural specification. Both GFI (0.915) and AGFI (0.900) exceed the 0.90 criterion, implying that a high proportion of the observed variance–covariance structure is captured by the model. Likewise, the NFI (0.915), TLI (0.982), and CFI (0.983) are all above 0.90, with TLI and CFI approaching unity, a pattern typically taken as evidence of an excellent comparative fit relative to a null model (Fang et al., 2022).

Table 4.6 Model Fit Metrics

Fit index	χ2/df	RMSEA	GFI	AGFI	NFI	TLI	CFI
Reference standards	<3	<0.08	>0.9	>0.9	>0.9	>0.9	>0.9
Result	1.221	0.024	0.915	0.900	0.915	0.982	0.983

4.2.2.2 Path Analysis for Direct Effects

As shown in Table 4.7, the direct effects were evaluated using standardized path coefficients (β), standard errors (S.E.), critical ratios (C.R.), and p-values. The standardized coefficient β indicates the direction and relative magnitude of each hypothesized relationship. The C.R., which reflects the ratio of the estimated effect to its standard error, is used to determine statistical significance. In SEM, paths are typically considered significant when $p < 0.05$ and the absolute value of C.R. exceeds 1.96, whereas non-significant paths are indicated by $p > 0.05$ and $|C.R.| < 1.96$ (Ali et al., 2023).

The results show that both subjective knowledge (SK) and objective knowledge (OK) significantly predict the four health-belief constructs, thereby supporting the theorized knowledge-to-belief mechanisms (H3a–H3d and H4a–H4d). Specifically, SK has significant positive effects on perceived benefits (PB; H3a), perceived susceptibility (PS; H3c), and perceived severity (PSV; H3d), while exerting a significant negative effect on perceived barriers (PBA; H3b) (β = 0.273–0.305 for the positive paths

and β = −0.380 for the negative path, all p < 0.001). Likewise, OK shows significant positive effects on PB (H4a), PS (H4c), and PSV (H4d), and a significant negative effect on PBA (H4b) (β = 0.330–0.403 for the positive paths and β = −0.293 for the negative path, all p < 0.001).

In contrast, neither SK nor OK has a significant direct effect on green food consumption behavior (GCB), providing insufficient evidence to support the proposed direct knowledge-driven behavioral pathways (H1 and H2). As reported in Table 4.7, the SK → GCB path (H1) is non-significant (β = 0.048, p = 0.539), and the OK → GCB path (H2) is also non-significant (β = 0.020, p = 0.786). Instead, GCB is significantly explained by belief-based evaluations and cues, consistent with the hypothesized belief-to-behavior links. Specifically, PB positively predicts GCB (H5a; β = 0.166, p = 0.004), PBA negatively predicts GCB (H5b; β = −0.156, p = 0.012), PS positively predicts GCB (H5c; β = 0.231, p < 0.001), and PSV positively predicts GCB (H5d; β = 0.206, p = 0.003). In addition, cues to action (CA) also shows a significant positive effect on GCB (H10; β = 0.215, p < 0.001). Collectively, these direct-effect findings suggest that knowledge is more strongly associated with green food consumption behavior through consumers' health-belief evaluations and risk perceptions (H3a–H3d and H4a–H4d), as well as the belief- and cue-driven pathways to behavior (H5a–H5d and H10), rather than through a direct knowledge-to-behavior route (H1 and H2). This pattern will be further examined in the subsequent mediation analysis.

Table 4.7 Direct Path Effects

hypothesis	Path	β	S.E.	C.R.	P	Results
H1	SK → GCB	0.048	0.081	0.615	0.539	Not-supported
H2	OK → GCB	0.020	0.072	0.272	0.786	Not-supported
H3a	SK → PB	0.273	0.064	4.301	***	Supported
H3b	SK → PBA	-0.380	0.065	-5.898	***	Supported
H3c	SK → PS	0.305	0.071	4.510	***	Supported
H3d	SK → PSV	0.291	0.062	4.364	***	Supported
H4a	OK → PB	0.331	0.059	5.385	***	Supported
H4b	OK → PBA	-0.293	0.057	-4.910	***	Supported
H4c	OK → PS	0.330	0.064	5.087	***	Supported

Table 4.7 (continued)

hypothesis	Path	β	S.E.	C.R.	P	Results
H4d	OK → PSV	0.403	0.058	6.083	***	Supported
H5a	PB → GCB	0.166	0.059	2.864	0.004	Supported
H5b	PBA → GCB	-0.156	0.063	-2.510	0.012	Supported
H5c	PS → GCB	0.231	0.064	3.585	***	Supported
H5d	PSV → GCB	0.206	0.077	2.995	0.003	Supported
H10	CA → GCB	0.215	0.065	3.620	***	Supported

Note: SK: Subjective Knowledge; OK: Objective Knowledge; GCB: Consumption Behavior toward Green Food; PB: Perceived Benefits; PBA: Perceived Barriers; PS: Perceived Susceptibility; PSV: Perceived Severity; CA: Cues to Action.

Hypotheses are supported if the critical ratio (C.R.) > 1.96 and $p < 0.05$; otherwise, non-supported.

***: $p<0.001$.

Figure 4.6 presents the standardized structural model estimated in AMOS, depicting the theorized causal relationships among the latent constructs and their observed indicators. Each latent variable—subjective knowledge, objective knowledge, perceived benefits, perceived barriers, perceived susceptibility, perceived severity, cues to action, and green food consumption behavior—is represented by an ellipse, while the corresponding observed indicators appear as rectangular measurement items, each linked to its latent construct through factor loadings and associated error terms that quantify unexplained variance. The directional arrows illustrate the hypothesized structural paths among the latent variables, with the accompanying standardized coefficients indicating both the magnitude and direction of these effects. Positive coefficients reflect enhancing influences, whereas negative coefficients indicate inhibitory relationships. The model shows substantial effects of both subjective and objective knowledge on multiple mediating perceptual constructs, which in turn exert direct influences on green food consumption behavior. The error variances attached to each indicator and the residual term associated with the endogenous behavioral construct reveal the degree to which the model accounts for observed variability.

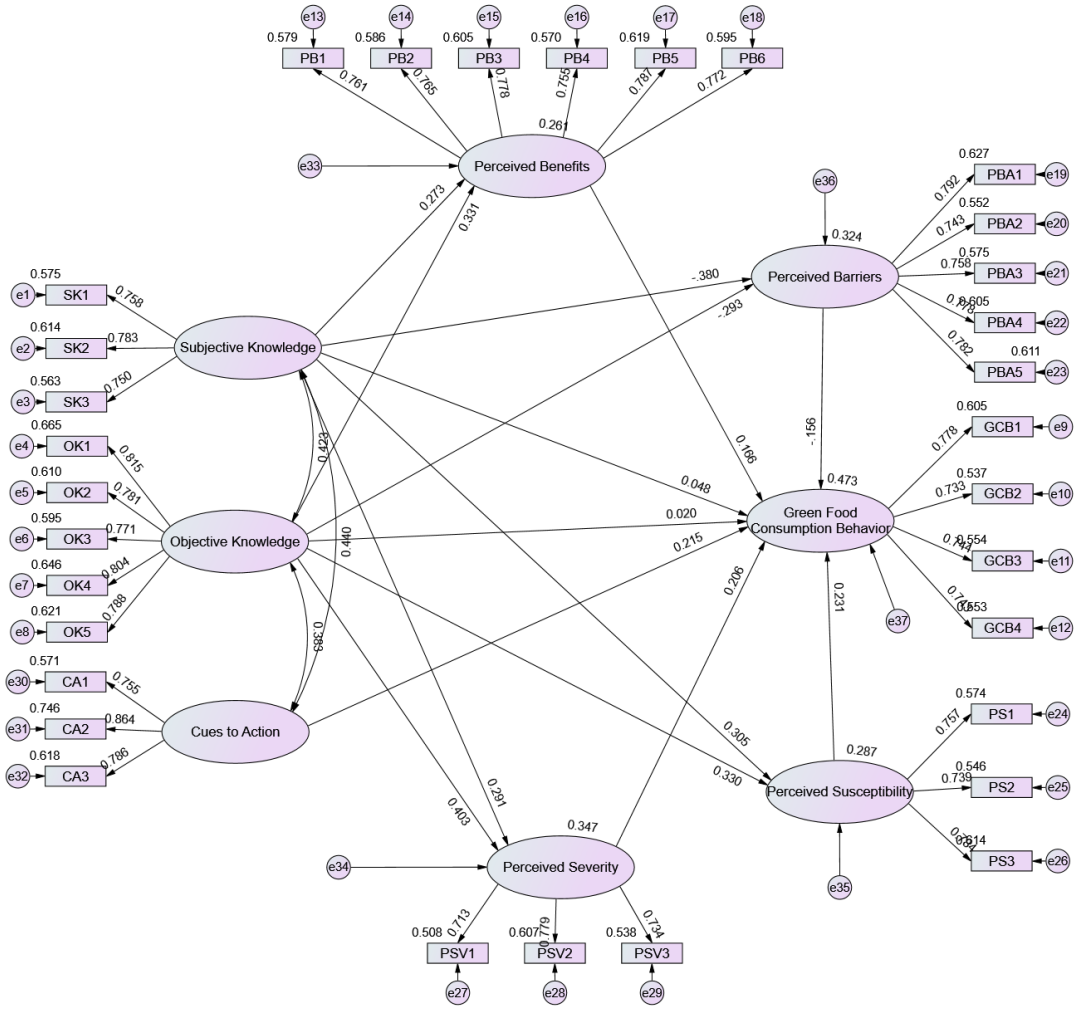

Figure 4.6 Structural model diagram in AMOS

To visually consolidate the direct path estimates summarized in Table 4.9, Figure 4.7 presents the standardized structural model highlighting only the statistically tested direct effects among the latent constructs. This diagram allows for a more intuitive inspection of the magnitude and direction of the estimated β-coefficients, making clear which hypothesized relationships exert meaningful influence on green food consumption behavior (GCB) and which do not. The figure illustrates the absence of significant direct effects from both subjective knowledge (SK) and objective knowledge (OK) to GCB, while simultaneously depicting their strong positive or negative impacts on the four health-belief mediators—perceived benefits (PB), perceived barriers (PBA), perceived susceptibility (PS), and perceived severity (PSV). Consistent with the numerical results, the perceptual constructs and cues to action (CA) appear as the primary proximal determinants of GCB, each showing significant direct pathways. By visually mapping

these causal linkages, Figure 4.7 reinforces the interpretation that green food consumption is not shaped directly by knowledge but rather operates through a network of mediating perceptual evaluations that translate cognitive inputs into behavior.

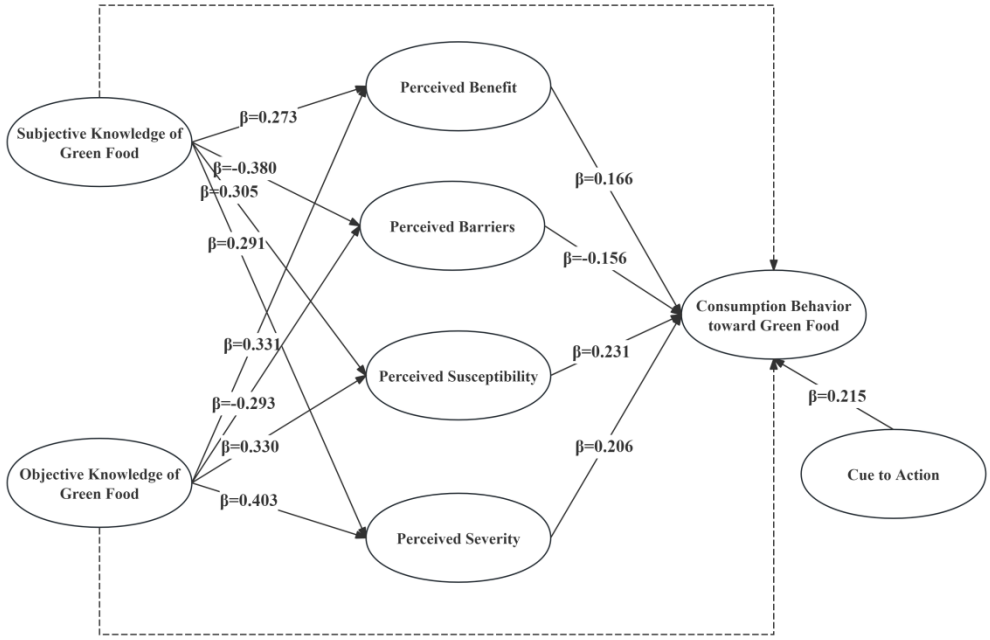

Figure 4.7 Structural Model Showing Direct Effects on Green Food Consumption Behavior

4.2.2.3 Path Analysis for Indirect Effects

As shown in Table 4.8, indirect effects were tested using a bootstrap procedure. The effect value reports the bootstrapped indirect effect of knowledge on green food consumption behavior (GCB) through each mediator, and the standard error (SE) reflects sampling variability. Statistical significance was determined using the bias-corrected 95% confidence interval (CI). An indirect effect is considered significant when the CI does not include zero, whereas a CI that crosses zero indicates that the mediation is not supported (Wang et al., 2020).

For objective knowledge (OK), all four hypothesized indirect paths are significant, providing full support for the proposed mediation hypotheses (H6a–H9a). Specifically, the indirect effect through perceived benefits (PB) is significant (H6a; effect = 0.054, SE = 0.030, 95% CI = [0.007, 0.128]). The indirect effect through perceived barriers (PBA) is also significant (H7a; effect = 0.045, SE = 0.029, 95% CI = [0.001, 0.125]). In addition, OK shows significant indirect effects through perceived susceptibility

(PS) and perceived severity (PSV), supporting H8a (effect = 0.074, SE = 0.036, 95% CI = [0.015, 0.153]) and H9a (effect = 0.081, SE = 0.044, 95% CI = [0.015, 0.195]), respectively. Taken together, these findings indicate that the relationship between objective knowledge and GCB is transmitted through multiple belief-based mechanisms, including benefit appraisal (H6a), barrier appraisal (H7a), and risk appraisal (H8a and H9a), with indirect effects falling in a small-to-moderate range.

For subjective knowledge (SK), three of the four proposed mediation paths are supported, offering partial support for the mediation hypotheses (H6b–H9b). The indirect effects through PB, PS, and PSV are all significant, supporting H6b (effect = 0.047, SE = 0.029, 95% CI = [0.009, 0.128]), H8b (effect = 0.073, SE = 0.036, 95% CI = [0.011, 0.145]), and H9b (effect = 0.062, SE = 0.036, 95% CI = [0.010, 0.179]). By contrast, the indirect effect through PBA is not significant, providing no support for H7b (effect = 0.061, SE = 0.041, 95% CI = [−0.004, 0.164]) because the confidence interval includes zero. This pattern suggests that subjective knowledge is linked to green food consumption mainly through benefit-related and risk-related perceptions (H6b, H8b, and H9b), whereas its proposed indirect influence through perceived barriers is not statistically confirmed under the current model specification (H7b).

Table 4.8 Indirect Effect Bootstrap Analysis

hypothesis	Mediation path	Effect value	SE	Bias-Corrected 95%CI		Results
				Lower	Upper	
H6a	OK → PB → GCB	0.054	0.03	0.007	0.128	Supported
H7a	OK → PBA → GCB	0.045	0.029	0.001	0.125	Supported
H8a	OK → PS → GCB	0.074	0.036	0.015	0.153	Supported
H9a	OK → PSV → GCB	0.081	0.044	0.015	0.195	Supported
H6b	SK → PB → GCB	0.047	0.029	0.009	0.128	Supported
H7b	SK → PBA → GCB	0.061	0.041	-0.004	0.164	Not supported
H8b	SK → PS → GCB	0.073	0.036	0.011	0.145	Supported
H9b	SK → PSV → GCB	0.062	0.036	0.010	0.179	Supported

Note: SK: Subjective Knowledge; OK: Objective Knowledge; GCB: Green Food Consumption Behavior; PB: Perceived Benefits; PBA: Perceived Barriers; PS: Perceived Susceptibility; PSV: Perceived Severity; CA: Cues to Action.

4.2.2.4 Total Effects

Table 4.9 reports the standardized total effects obtained from the bootstrap procedure, where each coefficient represents the combined influence of a predictor on green food consumption behavior (GCB) through both direct and all specified indirect paths. The standard error (SE) reflects the sampling variability of these total effects under repeated resampling, and the bias-corrected 95% confidence interval (CI) provides an interval estimate that adjusts for potential non-normality in the sampling distribution. When the lower and upper bounds of the CI do not cross zero, the corresponding total effect is considered statistically significant at the 5% level; if zero falls within the interval, the overall effect is not statistically distinguishable from zero (Wang et al., 2020).

As shown in Table 4.9, cues to action (CA), subjective knowledge (SK), and objective knowledge (OK) all exert positive and statistically significant total effects on GCB. CA has a total effect of 0.237 (SE = 0.096, 95% CI [0.054, 0.440]), confirming the motivational role of external prompts and informational stimuli in activating green food purchasing. SK shows the largest total effect on GCB (0.293, SE = 0.100, 95% CI [0.116, 0.520]), indicating that consumers' perceived familiarity with green food substantially enhances their likelihood of engaging in green food consumption once all mediating pathways are taken into account. OK also has a comparably strong total effect (0.273, SE = 0.082, 95% CI [0.117, 0.442]), suggesting that factual, verifiable knowledge about green food similarly promotes actual consumption behavior. Together, these results underscore that both internal knowledge resources (subjective and objective) and external cues to action jointly shape green food consumption through a combination of direct and indirect mechanisms.

Table 4.9 Total Effects

Effect path	Effect size	SE	Bias-Corrected 95%CI	
			Lower	Upper
CA→GCB	0.237	0.096	0.054	0.440
SK→GCB	0.293	0.100	0.116	0.520
OK→GCB	0.273	0.082	0.117	0.442

Note: SK: Subjective Knowledge; OK: Objective Knowledge; GCB: Green Food Consumption Behavior; PB: Perceived Benefits; PBA: Perceived Barriers; PS: Perceived Susceptibility; PSV: Perceived Severity; CA: Cues to Action.

4.2.2.5 The Effects of Control Variables

Table 4.10 summarizes the effects of the control variables on green food consumption behavior (GCB), including age, average monthly income, education level, and marital status. The standardized regression coefficient (β) indicates the direction and relative magnitude of each effect after accounting for the focal constructs in the structural model. The standard error (S.E.) reflects estimation uncertainty, and the t statistic (T) is used to evaluate whether the coefficient differs significantly from zero. Effects are considered statistically significant when the p value is below 0.05 (Ali et al., 2023).

The results show that average monthly income and education level are both significant positive predictors of GCB. Specifically, income exhibits a positive effect ($\beta = 0.11$, $T = 2.391$, $p = 0.003$), suggesting that women with higher monthly income are more likely to engage in green food consumption. Education level also demonstrates a significant positive effect ($\beta = 0.17$, $T = 2.208$, $p = 0.001$), indicating that higher educational attainment is associated with stronger green food consumption behavior. By contrast, age shows a negative but non significant association with GCB ($\beta = -0.111$, $T = -1.868$, $p = 0.063$), implying only a weak tendency for older respondents to report lower green food consumption, which does not reach conventional significance. Marital status has no significant effect on GCB ($\beta = -0.022$, $T = -0.348$, $p = 0.728$). Overall, these findings indicate that, net of the key theoretical variables, income and education remain relevant sociodemographic correlates of green food consumption behavior, whereas age and marital status do not show systematic explanatory power in this sample.

Table 4.10 Control Variables Effects

Control variables	Dependent variable	β	S.E.	T	P	Results
Age	GCB	-0.111	0.069	-1.868	0.063	Not-supported
Average monthly income	GCB	0.11	0.046	2.391	0.003	Supported
Education level	GCB	0.17	0.077	2.208	0.001	Supported
Marital status	GCB	-0.022	0.079	-0.348	0.728	Not-supported

Note: GCB: Green Food Consumption Behavior.

4.3 Conclusion

The results reported in this chapter confirm that the dataset and measurement instrument are adequate for hypothesis testing. The descriptive profile indicates that the sample of 676 Beijing female consumers displays sufficient variability across all constructs, and the measurement model demonstrates strong psychometric quality. Specifically, reliability and validity evaluations provide consistent evidence of internal consistency, convergent validity, and discriminant validity, while the measurement model fit indices indicate that the latent constructs are well represented by their observed indicators.

The structural model results provide a clear account of how knowledge is linked to green food consumption behavior. Subjective knowledge and objective knowledge do not exert significant direct effects on green food consumption behavior, which leads to the non support of H1 and H2. Instead, both forms of knowledge influence behavior through belief based mechanisms. Perceived benefits, perceived susceptibility, perceived severity, and cues to action show significant positive effects on green food consumption behavior, whereas perceived barriers show a significant negative effect, indicating that benefit appraisal, risk appraisal, and external activation cues function as proximal drivers of consumption behavior. The bootstrap mediation tests further show that objective knowledge affects green food consumption through all four health belief mediators, while subjective knowledge operates through perceived benefits, perceived susceptibility, and perceived severity, but not through perceived barriers, resulting in the non support of the SK to perceived barriers to behavior mediation path. Finally, among the control variables,

average monthly income and education level have significant positive associations with green food consumption behavior, whereas age and marital status do not show significant effects.

Taken together, These findings will be further discussed in the next chapter by comparing with existing literature, explaining the non-significant direct effects, and deriving theoretical and practical implications, thus forming a complete logical chain from results to discussion, implications, and final conclusion.” This revision eliminates ambiguity in chapter transitions and ensures a coherent narrative across the entire manuscript.

CHAPTER 5
DISCUSSION AND CONCLUSION

In line with the conceptual framework and the empirical evidence reported in Chapter Four, this discussion is organised around the four research objectives. The aim is to explain which relationships are supported, which are not, and what mechanisms may account for the overall pattern. The results show a consistent structure. Subjective knowledge and objective knowledge are strongly associated with perceived benefits, perceived barriers, perceived susceptibility, and perceived severity. However, neither form of knowledge demonstrates a statistically significant direct effect on green food consumption behaviour. This contrast suggests that knowledge does not translate into action automatically in the present model. Instead, knowledge appears to operate through belief based evaluations and risk appraisals that function as more proximal decision mechanisms. This interpretation is reinforced by the finding that perceived benefits, perceived barriers, perceived susceptibility, perceived severity, and cues to action directly predict green food consumption behaviour. The bootstrap tests further indicate that knowledge affects behaviour mainly through indirect pathways. Objective knowledge shows stable mediation through all four belief dimensions, whereas subjective knowledge demonstrates a more selective mediation pattern. Finally, the analysis of demographic controls adds a complementary layer by showing which socio economic attributes remain relevant after the key psychological mechanisms are accounted for. Based on this logic, the following sections discuss RO1 to RO4 in sequence, integrating the statistical evidence with theoretical reasoning and prior scholarship, while also explaining the implications of both supported and non supported relationships for understanding Chinese women's green food consumption.

RO1: To investigate the impact of subjective knowledge and objective knowledge on Chinese women's green food consumption behavior.

RO1 aimed to test whether subjective knowledge and objective knowledge directly predict Chinese women's green food consumption behaviour within the proposed structural

model. The results indicate that the hypothesised direct knowledge to behaviour links are not supported. Specifically, H1 (SK → GCB) is not supported, with a very small coefficient and no statistical significance. Likewise, H2 (OK → GCB) is not supported. In addition to non significance, both coefficients are close to zero, suggesting that when the belief based constructs are simultaneously included, neither perceived familiarity nor factual knowledge independently explains meaningful variance in reported green food consumption.

However, these findings should not be interpreted as evidence that knowledge is irrelevant to green food consumption. Instead, the pattern across Chapter Four supports a more nuanced mechanism in which knowledge functions as a distal cognitive condition whose influence is mainly transmitted through belief based evaluations that are closer to action. This inference is directly supported by the strong and consistent paths from both knowledge constructs to the four Health Belief Model dimensions. Subjective knowledge significantly increases perceived benefits, perceived susceptibility, and perceived severity, and significantly reduces perceived barriers, with large critical ratios and $p < 0.001$ across these paths. Objective knowledge shows an equally robust pattern, exerting significant positive effects on benefits and risk perceptions and a significant negative effect on barriers . At the same time, the behavioural outcome is explained by the more proximal predictors. Perceived benefits positively predict consumption, perceived barriers inhibit consumption, perceived susceptibility and perceived severity both enhance consumption, and cues to action exert a significant activating role. Taken together, these results suggest that green food consumption is not shaped by knowledge as a direct behavioural driver, but by how knowledge is translated into benefit appraisal, barrier appraisal, risk appraisal, and situational activation.

A central theoretical lens for interpreting the non-significant direct paths (H1 and H2) is the well-documented “knowledge–action gap” (also discussed as the knowledge–behavior or awareness–behavior gap). The knowledge–action gap refers to a systematic disconnect in which individuals may possess relevant information, awareness, or even positive evaluations, yet still fail to enact the corresponding behavior. In the present context, knowing what green food is (objective knowledge) or feeling familiar with it (subjective knowledge) is not sufficient to produce routine purchasing unless that knowledge becomes personally motivating and practically actionable.

This gap is especially likely in consumption settings where (i) the target behavior carries immediate costs (e.g., price premiums, search effort, verification effort), (ii) the benefits are partially delayed or probabilistic (e.g., “reduced health risk” rather than instantly observable improvements), and (iii) market signals are ambiguous (e.g., confusion over labels or doubts about authenticity). Under such conditions, knowledge can raise awareness without creating behavioral momentum, because consumers still need a compelling personal reason to act and a feasible path to implement that action in everyday shopping.

The present findings show that health beliefs provide precisely this missing link. In HBM terms, knowledge must be transformed into (1) a clear benefit appraisal (“this choice will protect my health”), (2) a credible threat appraisal (“my family/I am genuinely at risk if I do not act”), and (3) a manageable feasibility appraisal (“the barriers are not too high”). Only when these belief-based appraisals are activated does knowledge acquire immediate behavioral force. This mechanism directly explains why the direct knowledge → behavior effects disappear once HBM variables are included: the beliefs absorb the explanatory power that knowledge would otherwise appear to have, because beliefs are more proximal to the decision moment than cognition alone.

In other words, the model supports a “knowledge → belief translation → behavior” process rather than a “knowledge → behavior” shortcut. This is not a methodological artifact but a theoretically meaningful result: it empirically justifies why integrating the Health Belief Model into this study was essential. The HBM constructs operationalize the psychological conversion process through which information becomes personally relevant (susceptibility/severity), instrumentally worthwhile (benefits), and realistically doable (lower barriers), thereby turning knowledge into actual green food consumption.

The bootstrapped mediation results further clarify why H1 and H2 are not supported at the direct level, while knowledge remains behaviourally consequential through indirect pathways. For objective knowledge, all four mediated routes are statistically significant, including the pathways through perceived benefits, perceived barriers, perceived susceptibility, and perceived severity. This indicates that factual, verifiable knowledge is consistently converted into behaviour through both value oriented evaluation and risk oriented appraisal, and it also reduces perceived obstacles in a manner that statistically translates into action. For subjective knowledge, three mediation paths are

supported but one is not, revealing a critical asymmetry. The pathways SK → PB → GCB, SK → PS → GCB, and SK → PSV → GCB are significant, whereas SK → PBA → GCB is non supported because the confidence interval crosses zero. This difference suggests that perceived familiarity helps strengthen perceived benefits and heighten health risk awareness, but it does not reliably reduce barriers in a way that consistently converts into purchasing behaviour. A plausible interpretation is that some barriers surrounding green food are not purely psychological, such as price premium, availability constraints, or trust uncertainty in market signals. Under these conditions, objective knowledge may be more effective than subjective familiarity in helping consumers navigate obstacles, which is consistent with the significant barrier mediated pathway observed for objective knowledge but not for subjective knowledge.

Several additional factors grounded in the chapter results help explain the knowledge behaviour gap observed in H1 and H2. First, the descriptive profile indicates a generally high level of endorsement for many constructs, including knowledge and behaviour items, with means concentrated around the upper end of the scale and negative skewness for most knowledge and behaviour indicators. Such a pattern can reduce effective variance and make it harder for knowledge to show an incremental direct contribution once belief variables are included. Second, the significant effect of cues to action implies that behavioural enactment depends on situational prompting, which can include media exposure, reminders, and informational triggers. Even when knowledge exists, purchasing may not occur unless the decision is activated by salient cues within everyday consumption routines. Third, the significant positive effects of two demographic controls also indicate that behavioural engagement is partly conditioned by resource and capability constraints. In the control variable analysis, average monthly income shows a significant positive association with green food consumption and education level also shows a significant positive effect, whereas age and marital status are not significant. This suggests that economic capacity and cognitive resources linked to education can facilitate the translation of beliefs into purchase behaviour, potentially overshadowing any direct influence of knowledge once the belief mechanisms are modelled. In other words, even knowledgeable consumers may not act if affordability and decision competence are constrained, while higher income and education can make the behavioural expression of green food preferences more feasible.

Importantly, interpreting H1 and H2 through the Knowledge–Action Gap also helps reconcile an apparent paradox: why do knowledge variables strongly predict all four belief dimensions, yet fail to predict behavior directly? The answer is that behavior is governed by "proximal determinants" (immediate motivations and constraints) more than "distal determinants" (general awareness). In this study, health beliefs and cues to action constitute those proximal determinants. Knowledge influences the cognitive content available to consumers, but beliefs determine whether that content is interpreted as urgent, beneficial, and feasible at the moment of purchase. This layered structure is theoretically consistent with behavior-change research that distinguishes between information possession and action readiness.

Finally, the total effects reconcile the non significant direct paths with the overall influence of knowledge in the model. When both direct and indirect components are combined, subjective knowledge and objective knowledge show significant positive total effects on consumption. This indicates that RO1 is achieved in two complementary senses. The model demonstrates that knowledge does not directly drive green food consumption after accounting for belief based predictors (thereby explaining the non supported H1 and H2), yet knowledge remains an important upstream factor whose behavioural relevance emerges through mediated belief mechanisms and activation cues, which provides a coherent bridge to the mechanism focused discussion in RO2 and RO3 and to the demographic conditioning evidence developed under RO4.

RO2: To analyze the influence pathways of subjective knowledge and objective knowledge on health beliefs (perceived benefits, perceived barriers, perceived susceptibility, perceived severity).

RO2 focuses on clarifying how subjective knowledge and objective knowledge shape the core Health Belief Model constructs, namely perceived benefits, perceived barriers, perceived susceptibility, and perceived severity. The structural results provide strong and consistent support for the proposed knowledge to belief pathways. Both knowledge constructs exert statistically significant effects on all four belief dimensions, indicating that knowledge functions as an upstream cognitive resource that systematically reorganises women's evaluations of gains, costs, and health risks associated with green food consumption.

For subjective knowledge, all four hypotheses are supported. H3a (SK → PB) is significant and positive, showing that women who perceive themselves as more familiar with green food are more likely to recognise and endorse its expected advantages. This pattern suggests that perceived familiarity strengthens the accessibility of favourable product meanings, such as health improvement and quality assurance, which raises the perceived payoff of consumption. H3b (SK → PBA) is significant and negative, indicating that higher subjective knowledge is associated with weaker perceived barriers. In behavioural terms, familiarity can reduce psychological friction during decision making, such as uncertainty, confusion about certification, and perceived inconvenience, thereby lowering barrier appraisal at the belief level even before actual purchase is considered. H3c (SK → PS) is significant and positive, and H3d (SK → PSV) is also significant and positive. These results indicate that subjective knowledge strengthens risk related beliefs, including perceived vulnerability to health problems and perceived seriousness of negative consequences, which is consistent with the assumption that awareness often increases both opportunity appraisal and threat appraisal. For some consumers, feeling knowledgeable does not only mean knowing what green food is, but also recognising what might happen if food quality is compromised, which elevates perceived susceptibility and severity.

For objective knowledge, the same four belief pathways are supported and the coefficients show a comparable or stronger pattern. H4a (OK → PB) is significant and positive, and H4b (OK → PBA) is significant and negative. This indicates that factual and verifiable knowledge strengthens benefit appraisal while reducing barrier appraisal, suggesting that objective knowledge can help women interpret labels, standards, or product information more accurately, reducing doubt and perceived transaction costs. Objective knowledge also shows strong positive effects on risk beliefs. H4c (OK → PS) is significant, and H4d (OK → PSV) is the strongest among the OK belief paths. The comparatively larger coefficient on severity implies that objective knowledge may be especially powerful in shaping beliefs about the seriousness of health consequences, perhaps because factual information is more likely to be grounded in concrete health related claims or safety standards that make the threat feel more credible and more consequential.

A key theoretical implication of RO2 is that the findings do not support a simple "knowledge increases benefits and decreases barriers" logic only. Knowledge

simultaneously increases perceived benefits and increases perceived susceptibility and severity. This dual pattern indicates that women's green food decision making is shaped by a combined gain threat appraisal structure. Green food is framed as a protective choice that offers health benefits, yet the motivation for protection is strengthened when consumers perceive higher vulnerability and higher severity regarding food safety or health outcomes. Within this model, subjective and objective knowledge both contribute to building this protective cognition, meaning that knowledge functions as an interpretive lens that heightens sensitivity to both positive returns and negative risks.

The comparison between subjective and objective knowledge also refines the pathway interpretation. Subjective knowledge shows the strongest absolute effect on barriers while objective knowledge shows the strongest effect on severity. This asymmetry suggests two distinct cognitive routes. Subjective familiarity may work primarily by reducing psychological resistance and simplifying decision processes, which lowers perceived barriers. Objective knowledge may work more strongly by strengthening the credibility and seriousness of risk and health related information, which elevates perceived severity. This differentiation is important for explaining why later mediation results show that objective knowledge produces consistent indirect behavioural influence through all belief dimensions, while subjective knowledge does not consistently translate through the barrier route. The RO2 evidence therefore provides the necessary mechanism foundation for interpreting RO3, because it shows that both knowledge forms are effective at shaping health belief cognitions, yet they may do so via slightly different emphases in belief formation.

Overall, RO2 is fully achieved. The SEM results provide robust support for all knowledge to health belief hypotheses H3a to H3d and H4a to H4d, confirming that both subjective knowledge and objective knowledge are significant antecedents of perceived benefits, perceived barriers, perceived susceptibility, and perceived severity. The findings also demonstrate that the cognitive role of knowledge in green food consumption should be understood as belief structuring rather than direct behavioural triggering, which logically positions health beliefs as the proximal psychological channel through which knowledge can later affect consumption behaviour.

RO3: To evaluate how health beliefs (perceived benefits, perceived barriers, perceived susceptibility, and perceived severity) and cues to action influence Chinese

women's green food consumption behavior, and to clarify the mediating roles of these belief-based mechanisms between knowledge and behavior.

RO3 examines whether the proximal HBM mechanisms and cues to action translate cognitive inputs into actual green food consumption behavior, and whether these mechanisms mediate the relationship between knowledge and behavior. The results provide strong evidence that belief based appraisals and cues to action function as the most immediate predictors of green food consumption behavior in this model. The findings also clarify that knowledge does not trigger behavior directly. Knowledge operates through the belief system, which then drives consumption.

1) Health beliefs and cues to action as proximal drivers of behavior

The direct path results in Table 4.7 show that all five proximal predictors of green food consumption behavior are statistically significant in the expected directions. Perceived benefits positively predict GCB (H5a). This indicates that when women believe green food brings meaningful advantages, their likelihood of consumption increases. The effect is consistent with the benefit maximisation logic of health protective decisions. In this context, benefits are not abstract. Chapter Four's descriptive evidence suggests that health is the dominant purchase consideration among respondents, which means that benefit appraisal is closely tied to everyday wellbeing goals. When benefits are salient, green food becomes an instrument for personal and family health management, which increases consumption frequency and commitment.

Perceived barriers negatively predict GCB (H5b). The negative coefficient confirms that even in a sample with relatively high knowledge and generally positive attitudes, barriers still exert a suppressing effect. Barriers in green food consumption typically involve price premiums, uncertainty about authenticity, search costs, inconvenience, and effort required to locate trustworthy outlets. Even when consumers recognise benefits, perceived obstacles can delay purchase, reduce repetition, and lower behavioural consistency. The significance of H5b implies that barrier reduction is not merely supportive. It is behaviour shaping.

Risk appraisal also shows substantial influence. Perceived susceptibility positively predicts GCB (H5c). Perceived severity positively predicts GCB (H5d). These coefficients are larger than the benefit coefficient, suggesting that risk sensitivity is a powerful motivational force. For health protective consumption, perceived threat does not

necessarily generate avoidance or denial when an effective protective option is available. In this case, green food provides a feasible coping response. Higher perceived susceptibility means women feel more exposed to possible health consequences associated with unsafe or low quality food. Higher perceived severity means these consequences are evaluated as serious and costly. When both are heightened, protective behaviour becomes more rational and more urgent, which translates into higher consumption.

Cues to action further strengthen behavioural activation. CA has a significant positive effect on GCB (H10). This indicates that external prompts and informational stimuli are not peripheral in this consumption domain. They function as activation triggers that move people from evaluation to action. Given the hybrid information environment described in Chapter Four, cues can include short video content, platform recommendations, influencer explanations of labels, supermarket promotions, and interpersonal suggestions. Cues to action matter because green food choices often require attention and effort. Even when beliefs are favourable, consumption may not occur without situational reminders and timely prompts that reduce inertia.

Taken together, the supported direct hypotheses H5a–H5d and H10 show that green food consumption behavior is shaped through a structured belief system. Benefits and threat perceptions raise motivation. Barriers suppress enactment. Cues to action create behavioural momentum. This configuration aligns with the logic of health protective decision making, where behaviour depends on both motivation and activation.

2) Clarifying mediation between knowledge and behavior

The mediation evidence in Table 4.8 directly addresses the second part of RO3. The results show that both objective knowledge and subjective knowledge influence green food consumption behavior primarily through belief based mechanisms. This is especially important because Table 4.9 shows that knowledge does not have significant direct effects on behavior, namely H1 and H2 are non supported. The absence of direct effects implies that knowledge alone does not guarantee behavioural change. Knowledge must be translated into meaningful appraisals that either enhance motivation or lower friction.

For objective knowledge, all four mediating paths are significant and the bias corrected confidence intervals do not include zero. The indirect effect through benefits is supported. This pattern indicates that objective knowledge consistently translates into behaviour by shaping gain appraisal, cost appraisal, and threat appraisal at the same time.

The stronger indirect effects through susceptibility and severity also match the direct effect pattern where PS and PSV have comparatively large behavioural coefficients. In practical terms, factual knowledge may increase consumption because it strengthens perceived risk credibility and reinforces the protective value of green food, while also reducing uncertainty related obstacles.

For subjective knowledge, three of the four mediation hypotheses are supported, and one is not. The benefits pathway is significant. This discrepancy is theoretically informative. Subjective knowledge reflects perceived familiarity rather than verifiable understanding. It can strengthen confidence and perceived benefits, and it can heighten perceived vulnerability and seriousness through increased attention to food safety narratives. It may not reliably reduce barriers in a way that produces behavioural change. Women may feel familiar with green food while still encountering price concerns, trust issues, and time costs that remain unresolved. The non supported H7b therefore implies that familiarity based knowledge is insufficient for removing structural and transactional obstacles. Barrier reduction that affects behaviour appears more dependent on objective knowledge that helps consumers interpret certification, verify authenticity, and navigate purchase channels efficiently.

Overall, RO3 is achieved through two convergent sets of evidence. The direct paths demonstrate that PB, PBA, PS, PSV, and CA are significant predictors of green food consumption behavior. The mediation tests demonstrate that both knowledge types influence behaviour through these belief mechanisms, while the direct knowledge to behaviour paths are non significant. These results confirm that the knowledge behaviour link is not automatic. It is conditional on belief translation and activation cues. Within this framework, green food consumption among Chinese women is best understood as a health protective behaviour that depends on perceived benefits and threats, is constrained by barriers, and is triggered by cues in the information environment.

RO4: To examine how demographic factors (marital status, education level, average monthly income, and age) shape Chinese women's green food consumption behavior.

RO4 examines whether demographic characteristics contribute to systematic differences in Chinese women's green food consumption behavior after the core cognitive and belief based mechanisms are accounted for. The control variable results reported in

Table 4.10 show a differentiated pattern. Average monthly income and education level remain significant predictors of green food consumption behavior. Age and marital status do not show statistically significant effects within the current model specification. This set of findings suggests that green food consumption is not uniformly distributed across the population. It is more sensitive to socioeconomic capacity and human capital related differences than to family status differences, once knowledge, beliefs, and cues to action are included in the structural model.

First, average monthly income has a significant positive effect on green food consumption behavior. The standardized coefficient indicates a positive association, which supports the conclusion that women with higher income levels are more likely to engage in green food consumption. This result is substantively plausible in the Beijing context because green food is often positioned as a premium product. Purchasing certified green food commonly involves higher unit prices, greater search time, and sometimes delivery or membership costs. Higher income consumers have stronger affordability and lower perceived opportunity costs, which reduces the friction created by price and access constraints. The income effect also aligns with the model's psychological mechanisms. Even when perceived benefits are high and health risk appraisals are salient, behaviour still requires the ability to translate intention into routine purchase. Income therefore functions as a structural enabler that allows belief driven motivation to be enacted through consistent buying behaviour.

Second, education level also shows a significant positive effect on green food consumption behavior, and the effect size is larger than the income coefficient in standardized terms. This indicates that higher educational attainment is associated with stronger green food consumption even after the main theoretical variables are controlled. Education is likely to matter through several mechanisms. More educated consumers tend to have higher health literacy, stronger ability to interpret certification labels and ingredient information, and better capacity to evaluate competing claims in digital media environments. They may also have stronger information seeking habits and greater trust calibration ability, which helps them distinguish credible certification from marketing rhetoric. In practical terms, education can reduce cognitive uncertainty in purchase decisions, which indirectly weakens barrier related hesitation and strengthens the perceived diagnosticity of cues to action. This helps explain why education remains

significant even when subjective knowledge, objective knowledge, health beliefs, and cues to action are already included in the model. Education may shape the quality of knowledge processing rather than merely the amount of knowledge.

Third, age shows a negative but non significant relationship with green food consumption behavior. Although the coefficient suggests a tendency toward lower reported consumption among older respondents, the p value does not meet the conventional 0.05 threshold, indicating that the evidence is insufficient to claim a robust age effect. This near threshold result nevertheless carries interpretive value. It may indicate heterogeneity in how age relates to consumption patterns. Older consumers may exhibit stronger health concerns and therefore higher motivation, yet they may rely more on habitual purchasing routines, face greater digital information friction, or be more price sensitive depending on household budgeting responsibilities. These countervailing forces can attenuate the net age effect once belief based mechanisms are modelled. Another plausible explanation is that the cognitive and belief constructs in this study already capture much of the variance that age would otherwise explain. When perceived susceptibility and perceived severity are explicitly measured, age related health concerns may be absorbed into these latent mechanisms, leaving limited residual variance for age to predict.

Finally, marital status does not significantly predict green food consumption behavior. This implies that after accounting for knowledge, belief appraisals, and cues to action, differences between single, married, divorced, and widowed women do not translate into systematic differences in reported green food consumption. One reason is that green food in this sample appears embedded in routine household consumption rather than being a behaviour driven primarily by family role identity. Chapter Four's descriptive results indicate that green food is often consumed by multiple household members. This shared consumption pattern can dilute marital status differences because purchase decisions may reflect broad household health preferences and resource constraints rather than marital category membership per se. In addition, the motivational drivers in the structural model, especially perceived benefits, risk perceptions, and cues to action, are individual level psychological mechanisms that can operate similarly across marital categories, thereby reducing the incremental explanatory power of marital status.

Overall, RO4 is achieved by demonstrating that demographic effects are selective. Income and education serve as meaningful socio structural correlates of green food consumption behaviour, indicating that capability and literacy related resources continue to shape consumption even within a psychologically grounded model. Age and marital status do not show systematic effects in this sample once the core belief based pathways are included, suggesting that demographic differences in green food consumption are less about family status and more about socioeconomic capacity and information processing advantages.

5.1 Implication to Theories

5.1.1 Validation of the Knowledge–HBM–Cues to Action Mechanism

A central theoretical contribution of this study is that it reconceptualizes Chinese women's green food consumption as a belief formation and activation process rather than a direct consequence of "knowing more." Prior sustainable consumption research often assumes that stronger knowledge naturally converts into greener purchasing, yet growing evidence shows that knowledge frequently stalls at awareness and fails to generate stable consumption patterns (Butar Butar et al., 2024; Shrestha, 2021). By foregrounding health beliefs and cues to action, the present study offers a mechanism that explains this discontinuity without treating consumers as irrational or inconsistent.

This study contributes by repositioning consumer knowledge as a distal cognitive resource whose behavioral relevance depends on how it is translated into appraisal structures. In green food markets, information is rarely absorbed as neutral facts because consumers must interpret certification, authenticity, and safety claims under uncertainty (Truong et al., 2021). Accordingly, knowledge in this framework is not theorized as an immediate behavioral driver but as an upstream input that shapes perceived benefits, perceived barriers, perceived susceptibility, and perceived severity, which together form the evaluative logic of protective consumption.

A second contribution lies in the explicit differentiation between subjective knowledge and objective knowledge within one integrated model. Recent research warns that perceived understanding and factual accuracy often diverge, and they can trigger different cognitive routes in ethical or sustainable purchasing (Dirwan, 2023; Soe & Ketkaew, 2025). Building on this line of work, the present study treats subjective

knowledge as a confidence based resource that supports self validation in judgment, while objective knowledge operates as an accuracy based resource that sharpens evaluative discrimination. This distinction matters theoretically because it moves sustainability research away from a single knowledge variable and toward a multi dimensional cognition architecture.

A third contribution is that the study replaces the broad “attitude” intermediary with a structured set of health belief appraisals, thereby opening the black box of how cognition becomes action. In health oriented consumption, general favorability toward green food is often too coarse to explain why consumers accept premiums, tolerate inconvenience, or persist under verification costs (Alsubhi et al., 2023). By decomposing the internal appraisal layer into benefit appraisal, barrier appraisal, and threat appraisal, the model clarifies which psychological evaluations actually carry behavioral force in food safety related decisions. This improves theoretical precision because it specifies what is being evaluated, rather than assuming that attitude is a single unified state.

A fourth contribution is the elevation of cues to action as a theoretically necessary activation condition rather than a peripheral control factor. In contemporary digital and family centered decision environments, purchase behavior is frequently triggered by salient reminders, expert prompts, and socially circulating risk information that make protective action feel immediate (Islam et al., 2024). Treating cues to action as part of the core mechanism allows the model to explain why consumers with similar beliefs may still differ in behavior depending on whether triggering information is present at the point of decision. This perspective aligns the model with modern information ecologies where exposure, salience, and timing shape behavioral execution.

Overall, the integrated mechanism contributes to theory by specifying a coherent pathway in which knowledge reshapes belief based appraisal, and cues to action help convert appraisal into consumption. This moves beyond single theory approaches that either over rely on knowledge effects or under specify how internal evaluations are organized. The result is a more transferable explanation for health related sustainable consumption that can be extended to other contexts where safety, trust, and verification complexity dominate consumer decisions.

5.1.2 Theoretical Refinement of Knowledge: Why Direct Knowledge Effects Disappear

This study refines the theoretical status of knowledge in green food consumption by treating knowledge as a differentiated cognitive resource rather than a single undifferentiated input. Much of the sustainable food literature still operationalizes consumer knowledge as a unitary construct, which makes it difficult to separate the effect of feeling informed from the effect of being accurately informed (Garrido-Castro et al., 2025; Nichifor et al., 2025). By explicitly distinguishing subjective knowledge from objective knowledge, this study clarifies that knowledge operates through qualitatively different psychological functions that are easily conflated when knowledge is modeled as one aggregate variable.

Subjective knowledge primarily reflects perceived familiarity and confidence in one's own judgment, which can increase readiness to interpret green food information as personally relevant and to rely on heuristic cues when making choices (Ou & Ho, 2024). Objective knowledge, in contrast, reflects factual comprehension that supports more analytic discrimination among product claims, certification logos, and ingredient or production information, especially when consumers face competing labels and mixed-quality market signals. Conceptually, separating these two forms makes it possible to explain why some consumers report strong self perceived competence while still behaving inconsistently, and why others possess accurate information but remain reluctant to act when situational constraints are salient.

More importantly, the study explains why knowledge may fail to show a direct behavioral role in the green food context without implying that knowledge is irrelevant. Green food decisions are typically made under uncertainty about authenticity and under heightened sensitivity to health related risks, which means consumers rarely convert knowledge into action through a simple cognition to behavior translation (Lian et al., 2025). Instead, knowledge tends to function as a distal resource that reshapes belief based appraisals, including perceived benefits, perceived threats, and perceived barriers that determine whether a purchase feels necessary, worthwhile, and feasible. When certification credibility, label clarity, and trust in market supervision are not taken for granted, knowledge alone may increase awareness but still be insufficient to produce

action unless it simultaneously strengthens beliefs that the product is both protective and reliably verified (Lian et al., 2025).

This refinement also deepens theory by clarifying the mechanism through which subjective knowledge and objective knowledge shape belief formation in different ways. A confidence based route suggests that subjective knowledge can amplify benefit and risk salience by making consumers feel capable of evaluating health information, but this route can be fragile when the market contains ambiguous labels and inconsistent certification signals. Under such conditions, higher subjective knowledge can coexist with persistent perceived barriers, because confidence does not necessarily remove concerns about price premiums, inconvenience, or the effort required to authenticate a product's legitimacy. An accuracy based route suggests that objective knowledge improves belief calibration by providing concrete criteria for judging certification and product information, yet even calibrated beliefs may not transform into behavior when consumers anticipate high transaction costs or limited accessibility in everyday shopping environments (Akter et al., 2024).

Taken together, the study reframes the absence of direct knowledge effects as a theoretically meaningful specification rather than a weakness. It indicates that knowledge contributes most strongly when it performs a structural function, namely reorganizing a belief system that translates information into motivation and action readiness, while external and practical frictions determine whether that readiness becomes actual consumption. This perspective extends prior knowledge based accounts of sustainable consumption by shifting the theoretical question from whether knowledge "matters" to how different forms of knowledge are converted into belief based appraisals that can survive uncertainty, distrust, and convenience constraints in certified green food markets.

5.1.3 Internal Differentiation of Health Beliefs and the Role of Cues to Action

A key theoretical contribution of this study is to move beyond the common "HBM as a single belief block" treatment that dominates much of the green and healthy food literature. In many prior studies, perceived benefits, perceived barriers, perceived susceptibility, and perceived severity are introduced as a set of parallel predictors and then interpreted collectively, as if they reflect one underlying health motivation that rises or falls together. That practice is useful for showing that "health beliefs matter," but it often leaves the internal logic of belief based decision making under specified, especially in

certified product markets where consumers must simultaneously evaluate value, risk, and credibility. This study contributes by theorizing the four constructs as functionally different mechanisms rather than interchangeable indicators, and by showing why that internal differentiation is necessary to explain certified green food consumption among Chinese women.

First, the study refines HBM by specifying a dual channel motivational structure that prior work often collapses into a single health orientation. In the certified green food setting, perceived benefits operate as an approach channel that legitimizes the choice through expected gains such as safer ingredients, better health protection, and improved family well being, which aligns with consumer value accounts that emphasize positive utility as the main driver of repeated purchase. Perceived susceptibility and perceived severity operate as a threat channel that makes the same choice feel necessary rather than merely desirable, because the decision is framed as avoiding harm under conditions of food safety uncertainty. Earlier studies frequently discussed “risk perception” as a background factor or merged it into general attitudes, which weakens theoretical precision because the psychological logic of acting to gain benefits is not the same as acting to prevent harm (Wang et al., 2024). By separating benefit based justification from threat based urgency, this study extends HBM from a general health motivation account to a mechanism explanation that fits certification based green consumption, where protection motives can be as decisive as enjoyment or preference.

Second, the study advances HBM by clarifying that perceived barriers are not simply the negative mirror image of perceived benefits. A common assumption in prior sustainable consumption research is that when consumers perceive stronger benefits, barriers will naturally fade in importance, implying a single continuum from favorable to unfavorable evaluation (Sharma, 2024). In certified green food markets, however, barriers are structurally anchored in price premiums, verification effort, and labeling ambiguity, so they function more like a feasibility gate that can block behavior even when benefits and risks are both salient (Stoica et al., 2025). Treating barriers as a distinct constraint mechanism improves the explanatory power of HBM because it addresses the well documented attitude behavior gap in ethical and sustainable purchasing, where endorsement does not reliably translate into actual buying routines. The theoretical step forward here is not merely stating that “barriers matter,” but positioning barriers as the

conversion condition that determines whether the dual channel motivation can be enacted in everyday shopping decisions.

Third, the study strengthens the theoretical status of cues to action by positioning them as a proximal trigger rather than a peripheral add on. In much of the classic HBM tradition, cues to action are acknowledged but operationalized weakly, often treated as a simple reminder variable with limited theoretical discussion. More recent work on digital and social information environments suggests that exposure, prompts, and repeated informational signals can actively shape what feels urgent, normal, and decision relevant, especially in consumption domains saturated with claims and competing messages (Schifferstein et al., 2021). This study contributes by elevating cues to action to a mechanism that completes the belief to behavior translation in certification dependent choices: it is not only that people "receive information," but that informational prompts make benefits and threats cognitively available at the moment of choice and reduce hesitation under uncertainty. In this sense, cues to action serve as the last mile activation pathway, connecting internal appraisals to concrete consumption behavior in ways that many earlier green food HBM studies did not theorize explicitly.

Taken together, the study offers a more context sensitive HBM for certified green consumption by (a) unpacking internal belief heterogeneity, (b) theorizing a dual channel structure of benefit justification and threat urgency, (c) treating barriers as a feasibility gate rather than a simple negative attitude component, and (d) establishing cues to action as a proximal activation mechanism shaped by contemporary information environments. This comparative refinement responds to the main limitation of prior research that confirmed "HBM works" but left unclear how different belief components coordinate to produce real purchasing behavior in high uncertainty certification markets.

5.1.4 Mediation Evidence and Boundary Conditions from Demographics

A further theoretical contribution of this study lies in demonstrating that green food consumption is shaped primarily through an indirect, mechanism driven pathway rather than through a straightforward knowledge driven route, which helps clarify why knowledge based interventions often produce uneven behavioural outcomes in certified sustainable food markets. Existing research commonly assumes that more knowledge should translate into more action, yet empirical work on sustainable and ethical consumption repeatedly observes a persistent attitude behaviour gap that cannot be

resolved by information provision alone (Casais & Faria, 2022; Falcão & Roseira, 2022). By showing that objective knowledge generates significant indirect effects through each of the four health belief components, the study strengthens a process view in which knowledge first reorganises benefit appraisal, threat appraisal, and constraint appraisal, and only then becomes behaviourally consequential (Wang et al., 2024).

Importantly, the mediation structure is asymmetric across knowledge types, which extends prior discussions that treat subjective knowledge and objective knowledge as largely interchangeable predictors of pro environmental purchase decisions (Rihn et al., 2021). The model indicates that subjective knowledge can meaningfully activate benefit and threat routes, but the pathway that relies on lowering perceived barriers does not reliably convert into actual consumption, implying that feeling knowledgeable does not necessarily reduce the lived frictions of price premiums, authenticity uncertainty, and verification effort in certified green food choices (Savari & Khaleghi, 2025). This asymmetric pattern adds theoretical nuance by separating confidence based familiarity from constraint reduction, and it is consistent with behavioural evidence that metacognitive confidence can coexist with structural obstacles and may even encourage simplified heuristics rather than deeper verification when product credibility is difficult to judge. In this sense, the study reframes the non effect of the subjective knowledge to barrier route not as a weakness, but as evidence that perceived barriers are partly institutionally produced and therefore less responsive to self assessed understanding than to market transparency and trust infrastructures.

The same mechanism centred logic also helps interpret the boundary conditions indicated by demographics, because even after beliefs and cues are accounted for, consumption remains partly shaped by resource and capability constraints. The finding that education and income show significant effects while age and marital status do not suggests that certified green food consumption is less about life stage labels and more about access to economic slack and the cognitive resources needed for label interpretation and credibility assessment (Tiboni-Oschilewski et al., 2024). This pattern aligns with sustainability consumption research showing that higher income increases the feasibility of paying price premiums, while higher education strengthens information processing capacity and reduces the cost of evaluating competing claims (Miao et al., 2025). The theoretical implication is that the knowledge and belief mechanism explains how

motivation is formed, but demographic resources set the practical limits of enactment, so green food consumption should be theorised as a joint outcome of psychological appraisal and structural feasibility rather than as a purely belief driven health decision.

5.2 Implication to Practitioners

5.2.1 For Green Food Industry Stakeholders

The findings of this study offer several practice-oriented insights for green food producers, processing companies, retailers, and digital commerce platforms. The empirical results indicate that both subjective and objective knowledge shape consumers' cognitive evaluations of green food in distinct ways, with objective knowledge enhancing perceived benefits and lowering perceived barriers, while subjective knowledge heightens perceptions of risk. At the same time, perceived barriers emerged as one of the strongest deterrents to actual green food consumption, whereas cues to action significantly strengthened behavioral engagement. These mechanisms suggest that rather than adopting a one-size-fits-all approach to information dissemination, industry stakeholders should adopt differentiated strategies aligned with their respective roles in the value chain—distinguishing between production-side actors (producers and processors) whose primary lever is objective knowledge, and retail-side actors (platforms and retailers) whose core competence lies in shaping subjective knowledge and activating behavioral cues.

First, for producers and processing companies, the strategic priority should be to establish Digital Traceability (based on QR Codes) as a foundational communication infrastructure that conveys objective knowledge. The study revealed that uncertainty surrounding the authenticity, safety, and certification of green food products remains a key point of hesitation for many consumers. Instead of generic standardized labeling, companies should print unique, scannable QR codes on each product package—these codes should link to a user-friendly mini-program or official platform that visually displays batch-specific traceability information, including production origin, planting/breeding processes, third-party quality inspection reports, green food certification details, and pesticide-free/residue test records. From a communication perspective, this approach transforms objective knowledge into a verifiable, self-directed consumer experience: when consumers can independently confirm product safety and authenticity through a simple scan, the credibility of the message is inherently higher than with brand-generated claims.

This tangible access not only improves consumers' objective knowledge but also translates directly into higher perceived benefits and lower perceived barriers—thereby converting traceability from a technical feature into a strategic communication tool that builds trust through transparency.

Second, for retailers and digital commerce platforms, the strategic focus should shift toward two distinct communication functions: situational cues that trigger immediate action, and social validation that mitigates subjective knowledge-driven risk. The significant effect of cues to action in the structural model demonstrates that consumer behavior is sensitive to timely reminders and environmental stimuli. Retailers and platforms are uniquely positioned to embed these cues into the purchase journey—through in-app notifications at decision moments, seasonal health-oriented promotions, visible point-of-sale prompts, and contextual short-video demonstrations. These interventions function not as persuasive messaging but as situational reinforcement that activates consumers' existing knowledge, consistent with the empirical evidence showing that such triggers serve as a direct driver of green food consumption.

Third, for platforms and marketing intermediaries, communication strategies should specifically target the psychological pathway of subjective knowledge by deploying Social Validation through parenting influencers and mom communities to reduce perceived risks. Since subjective knowledge was found to influence risk-related beliefs more strongly than benefit evaluations, communication efforts in this domain should prioritize credibility transfer over information volume. Collaborating with trusted parenting influencers, health KOLs, and local mom communities to share real-life consumption experiences, family-oriented green food meal plans, and authentic safety evaluations can effectively strengthen consumers' subjective knowledge and reduce their perceived risks. Strategically, this represents a shift from brand-centric promotion to community-centric communication: launching initiatives such as "green food identification tips for moms" or "family health recipes using certified green ingredients" allows consumers to gain familiarity through peer-based narratives, which are more effective than corporate messaging in weakening risk perceptions (e.g., doubts about safety or authenticity). Expert-supported explanations can complement this social validation, but the core communication vehicle should be trusted community channels that reduce perceived risk through relational credibility.

Overall, the results show that strategic segmentation across the value chain is essential for translating research findings into actionable communication frameworks. By assigning distinct roles—producers using digital traceability (QR Codes) to communicate objective knowledge and enhance perceived benefits; retailers embedding situational cues to trigger behavior; and platforms/intermediaries leveraging social validation (influencers/mom communities) to shape subjective knowledge and reduce perceived risks—the green food industry can move beyond generalized information campaigns toward a coordinated, psychologically aligned communication strategy that effectively supports healthier and more sustainable dietary practices among consumers. These actions not only align with the empirical pathways identified in this study but also help strengthen the long-term trust and engagement that are essential for the development of the green food sector.

5.2.2 For Health and Food Safety Agencies

The findings of this study indicate that health and food safety agencies hold a central position in shaping the cognitive and behavioral processes that lead consumers toward protective dietary actions. Both subjective and objective knowledge were shown to influence the development of health beliefs, particularly perceived susceptibility and perceived severity. These belief variables subsequently played a decisive role in predicting green food consumption. This pattern suggests that health agencies can meaningfully strengthen public decision making by providing authoritative, accessible and comprehensible knowledge that directly supports belief formation. When health communication delivers clear explanations regarding production standards, certification logic and specific health implications, individuals are more likely to interpret food safety risks accurately and to internalize a stronger motivation to choose certified green food. In doing so, agencies directly contribute to SDG 12.8, which calls for ensuring that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

The study also demonstrates that perceived barriers function as one of the strongest inhibitors of protective behavior. Many consumers remain hesitant because they face uncertainties about authenticity, inconsistent labeling or doubts about the reliability of certification systems. Health authorities can reduce these barriers by enhancing transparency in inspection procedures, publicizing the outcomes of safety monitoring

programs and improving the clarity of certification symbols. These actions reduce ambiguity in the consumption environment, thereby facilitating the transformation of knowledge and health beliefs into concrete behavior. When barriers are minimized, individuals experience greater confidence and lower cognitive cost in selecting products that align with their health beliefs. This transparency-oriented approach supports SDG 12.6, which encourages the adoption of sustainable practices and transparency in reporting, reinforcing the institutional conditions necessary for responsible consumption.

Another important implication concerns the role of cues to action. The results show that external informational prompts exert a significant and direct influence on behavior, which indicates that real time health communication can activate existing beliefs during moments of decision making. Health agencies can collaborate with community clinics, digital media outlets and retail locations to disseminate timely reminders related to food safety, seasonal contamination risks or recommended purchasing practices. Such cues provide immediate situational relevance and help convert cognitive awareness into actual behavioral implementation. This is especially important because knowledge and beliefs may remain dormant unless activated by contextual triggers that draw attention to health concerns at critical moments.

The gendered characteristics of the sample further underscore the importance of tailored communication strategies. Many women carry primary responsibility for household food decisions and show heightened sensitivity toward health risks. Health agencies can therefore enhance the effectiveness of public health messaging by incorporating family centered formats, practical purchasing guidelines and health protection materials designed for individuals who manage daily food preparation. This approach aligns with SDG 5.4, which calls for recognizing and valuing unpaid care and domestic work—here, by acknowledging women's disproportionate responsibility for household food management and providing them with accessible, actionable information that reduces their cognitive and time burden. These approaches strengthen the alignment between institutional communication and the lived responsibilities of the target group.

Overall, the study shows that health and food safety agencies can play a decisive role in enabling consumers to translate knowledge, beliefs and risk perceptions into safer dietary practices. By improving the accuracy and accessibility of food safety information, by reducing structural and informational barriers and by delivering timely cues that guide

decision making, agencies contribute to a social environment in which protective consumption becomes easier, more intuitive and more consistent with public health objectives.

5.2.3 For Certification and Regulatory Bodies

The findings of this study highlight the essential role that certification and regulatory bodies play in shaping the conditions under which consumers are able to make confident and health-oriented food choices. The empirical results show that perceived barriers exert a strong negative influence on green food consumption, which means that any ambiguity in certification processes, inconsistency in labeling or lack of public visibility regarding regulatory oversight can significantly weaken the impact of both subjective and objective knowledge. When consumers encounter unclear certification symbols or cannot easily distinguish authentic labels from imitation versions, the cognitive burden increases and the belief structure activated by knowledge becomes less effective in guiding behavior. Certification authorities therefore have a direct capacity to influence behavioral outcomes by ensuring that labeling systems remain transparent, standardized and resistant to misuse.

The study also demonstrates that perceived susceptibility and perceived severity play central roles in motivating protective consumption. These belief variables depend not only on individual knowledge but also on institutional credibility. Regulatory agencies can strengthen the credibility of belief formation by communicating the scientific rationale behind certification standards and by providing clear explanations of the testing procedures used to verify safety. When consumers observe systematic regulatory enforcement and accessible reports of inspection outcomes, they develop a stronger sense of trust in certified products. This trust amplifies the perceived benefits of green food and reinforces the belief that certified products effectively reduce health risks. As a result, the motivational force of perceived susceptibility and severity becomes more salient.

Another implication concerns the influence of cues to action, which the study identifies as a direct and significant predictor of green food consumption. Certification bodies contribute to these cues not only through labels, but also through the broader informational environment. Public announcements, periodic safety alerts and educational campaigns embedded within regulatory communication can serve as timely reminders that activate health beliefs during purchasing decisions. These cues help translate internal

motivations into concrete behavior by drawing attention to certification marks and by increasing the salience of verified products at the point of purchase. When certification agencies coordinate with retailers and digital platforms to highlight certified options, consumers encounter more frequent prompts that align with their desire to protect family health.

The gendered context of the sample further emphasizes the need for clear and family oriented certification communication. Women who manage household food responsibilities often rely on quick visual cues and straightforward labeling to make purchasing decisions under time constraints. Regulatory bodies can enhance the effectiveness of the certification system by adopting intuitive symbols, by simplifying label descriptions and by offering public guidance that illustrates how to recognize reliable certification marks. This improves the efficiency of consumer decision making and makes it easier for individuals with high health concern to select safer products.

Taken together, these findings show that certification and regulatory bodies are not peripheral actors but central determinants of behavioral realization in the knowledge belief behavior process. By clarifying certification standards, strengthening label reliability, enhancing institutional credibility and providing timely informational cues, regulatory institutions create an environment in which consumer knowledge and health beliefs can successfully translate into protective green food consumption. Their actions reduce uncertainty, lower psychological and informational barriers and reinforce the structural conditions necessary for consistent health oriented dietary choices.

5.2.4 For Community Health Workers and Consumer Educators

The results of this study underscore the critical role of community health workers and consumer educators in bridging the gap between health beliefs and sustained protective food behaviors. As subjective and objective knowledge were found to shape perceived benefits, susceptibility, and severity, community education initiatives play a pivotal role in influencing how individuals interpret food safety risks and evaluate the advantages of certified green food. When educational programs provide clear explanations of certification meaning, production standards, and practical guidance for identifying reliable products, they strengthen the cognitive processes that support accurate belief formation. This alignment between community-level knowledge dissemination and the

internal belief structure observed in the study significantly enhances an individual's readiness to adopt healthier consumption patterns.

The findings further identify perceived barriers as one of the strongest inhibitors of green food consumption, with many consumers struggling to interpret labels or confidently distinguish certified products in local markets. Community health workers and consumer educators can address these challenges through workshops, public lectures, and neighborhood information sessions that clarify common misconceptions about certification. Such activities reduce informational ambiguity and help consumers develop greater confidence in making safe, informed choices. As barriers are minimized in daily environments, the cognitive effort required for protective consumption decreases, making it easier for individuals to act on their health beliefs.

Notably, cues to action also emerge as a significant behavioral trigger, suggesting that community-based messaging can effectively activate existing beliefs during decision-making. Community centers, local organizations, and school-based educators can disseminate timely reminders about food safety risks, seasonal contamination patterns, and recommended purchasing strategies. These localized cues draw immediate attention to health concerns and help activate motivational processes at the point of purchase. When embedded in familiar community settings, such reminders become more relevant and their impact more consistent with the study's theoretical model.

Consistent with the sample's gendered nature, community engagement must align with women's daily responsibilities in food procurement and family health. Many women make rapid purchasing decisions under time constraints and rely on practical, easily accessible information. Community practitioners can meet these needs by providing simplified visual guides, neighborhood demonstrations, and user-friendly educational materials that reflect real-world household management practices. These interventions increase women's confidence in applying their knowledge and beliefs and reduce the cognitive strain associated with evaluating complex product information.

Overall, the empirical results indicate that community health workers and consumer educators occupy a central position in translating knowledge, beliefs, and behavioral intentions into actual green food consumption. By reducing informational barriers, reinforcing accurate belief formation, and providing timely cues to action, community-level initiatives create supportive conditions for the consistent adoption of

certified green food. These efforts not only enhance individual health protection but also advance broader public health goals by promoting safe, responsible, and informed dietary practices.

5.3 Limitation of the Study and Implications of Future Research

5.3.1 Limitation of the Present Study

This study offers a focused explanation of how subjective knowledge, objective knowledge, health beliefs, and cues to action jointly shape Chinese women's green food consumption. However, several limitations should be acknowledged in order to interpret the findings within an appropriate theoretical and empirical scope. Crucially, rather than merely treating these limitations as constraints, view each as indicating a distinct opportunity for theoretical extension—identifying specific pathways through which future research can refine, expand, and contextualize the knowledge–belief–behavior framework developed here. Conceptually, the framework prioritizes a knowledge based behavioral pathway that is translated through core health belief mechanisms and activated by proximal informational triggers. While this focus allows a clear account of belief formation and behavioral activation in a certified green food context, it also means that other relevant drivers were not explicitly modelled. For example, normative influence from family members and peers, moral and environmental value orientations, habitual purchasing routines, and broader market level constraints were not incorporated as independent constructs. As a result, the study clarifies one central mechanism of green food consumption rather than providing an exhaustive explanation of all psychological and structural determinants. This conceptual boundary opens an important theoretical extension opportunity: future research can integrate the present knowledge–belief framework with social norm theory, value-belief-norm theory, and habit theory to examine how health beliefs interact with—or are mediated by—normative pressures, moral considerations, and automatic routines. Such integration would allow a more comprehensive understanding of when health-related cognition dominates food choice versus when social or habitual forces override it.

The research design also places boundaries on generalisability. Data were collected from Chinese women operating within a market environment characterised by national certification standards, multi level labels, and sustained public concern over food safety.

The sample therefore captures decision making in a context where health protection and trust in certification are especially salient, and the observed relationships may not transfer directly to other populations or settings. The mechanisms may function differently for male consumers, for rural households with different access conditions, or for consumers in countries where certification systems, regulatory credibility, and food risk perceptions follow distinct institutional logics. These contextual boundaries create a theoretical extension opportunity to test the moderating effects of gender, household structure, and institutional context on the knowledge–belief–behavior pathway. Comparative research across these dimensions would reveal whether the model represents a universal psychological process or one that is contingent on culturally specific configurations of risk perception, certification credibility, and gendered household responsibilities. In addition, the cross sectional questionnaire design captures knowledge, beliefs, cues, and consumption at a single point in time. It cannot reveal how shifts in policy communication, media attention to food incidents, or changes in household roles and responsibilities may reshape the belief based pathways that were identified. This temporal limitation points to an extension opportunity for dynamic theorizing: longitudinal designs could specify how the relative influence of subjective versus objective knowledge shifts over time in response to external events, and whether perceived barriers and cues to action exhibit time-dependent effects on behavior.

Measurement choices introduce additional constraints. Although subjective and objective knowledge were established as distinct constructs, the objective knowledge assessment necessarily covered a limited set of items related to certification and product features, and it cannot fully represent the complexity of China's green food standards or consumers' diverse learning experiences. Perceived barriers were operationalised through key obstacles such as price concerns, label confusion, and doubts about authenticity, yet other constraints may also matter, including product availability across retail channels, time costs of searching and verification, and household level preference conflicts. These measurement boundaries offer theoretical extension opportunities to refine construct conceptualization. Future research can disaggregate perceived barriers into finer-grained dimensions—such as economic barriers, information barriers, access barriers, and trust barriers—to test whether each operates through distinct pathways (e.g., directly inhibiting behavior versus weakening the belief–behavior link). Similarly, expanding objective

knowledge measures to capture certification literacy, label comprehension, and procedural knowledge would allow testing of whether different knowledge domains differentially influence perceived benefits and perceived risk. Green food consumption behavior was assessed through self reported consumption related tendencies rather than through observed purchasing records. This approach is common in consumer research but may be influenced by recall bias and social desirability, especially in domains closely connected to health responsibility and socially approved choices. This measurement gap points to an extension opportunity for methodological triangulation: combining self-reported measures with objective behavioral data (e.g., purchase receipts, e-commerce transaction records, or retail loyalty data) would enable future research to test whether the model's pathways are robust across measurement modalities or whether social desirability systematically inflates the reported effect of health beliefs on behavior.

Finally, although the study controls for demographic characteristics, consumer behavior remains shaped by real world resource and capability conditions. In particular, differences in education and income can influence information processing capacity and purchasing feasibility, which may condition how knowledge and beliefs translate into action. This suggests that the proposed mechanism should be understood as operating within structural boundaries rather than as a purely psychological process. This observation opens a theoretical extension opportunity to theorize the interaction between psychological mechanisms and structural constraints. Future research can develop moderated mediation models examining whether income, education, and access to retail infrastructure moderate the translation of knowledge into health beliefs or the translation of beliefs into actual consumption—thereby specifying the boundary conditions under which the knowledge–belief–behavior pathway is most (or least) effective. These limitations do not negate the core contributions of the study, but they indicate that the conclusions should be interpreted within a clearly defined theoretical, methodological, and contextual range, and they motivate the refinements proposed in subsequent directions for future research.

5.3.2 Implications for Future Research

Building directly on the theoretical framework developed in this study, future research should pursue theory-driven extensions that refine, specify, and test the boundaries of the knowledge–health belief–cues model. Rather than enumerating broad

research directions, we identify specific theoretical questions that emerge from the present findings and propose research designs capable of addressing them.

First, the conceptual scope of the model can be extended by integrating additional theoretical constructs that may interact with or mediate the knowledge–belief–behavior pathway. The present framework prioritizes a knowledge-based behavioral pathway translated through core health belief mechanisms. However, in certified green food contexts, consumption decisions are also embedded in social networks, moral considerations, and repeated routines. A theoretically motivated extension would incorporate constructs from social norm theory (e.g., subjective norms, descriptive norms), value-belief-norm theory (e.g., moral obligation, environmental values), and habit theory (e.g., automaticity, routine strength) to test whether health beliefs remain the dominant translation layer when these alternative pathways are simultaneously modeled. This would allow future research to specify the theoretical boundary conditions under which health cognition versus social influence versus habitual automaticity governs green food consumption. For instance, it is possible that cues to action function primarily as informational triggers in low-habit consumers but as mere confirmatory signals in those with strong existing routines—a moderating hypothesis that remains untested. Such theoretical integration will ultimately empower policymakers to design tailored intervention matrices, shifting from one-size-fits-all education to targeted behavioral nudges based on consumers' habit strength and social environments.

Second, the model’s transferability and boundary conditions can be theorized by expanding demographic, cultural, and institutional contexts. The current sample comprises Chinese women in a risk-salient environment where trust in certification is high. A theory-driven extension would treat gender, household structure, and institutional context as theoretically specified moderators rather than merely as sampling variations. For example, future research could test whether the mediating role of perceived barriers differs across household structures where food purchasing autonomy varies, or whether the relative influence of subjective versus objective knowledge on perceived risk is moderated by the institutional credibility of certification systems. Cross-national comparisons would further advance theory by distinguishing which components of the model reflect universal psychological processes (e.g., the basic logic of health belief activation) versus those that are contingent on cultural configurations of risk perception, regulatory trust, and gendered

household responsibilities. Such comparative theorizing would contribute to a contingency theory of green food consumption, specifying how institutional and cultural factors systematically alter the strength and direction of the model's pathways. Ultimately, addressing these contextual boundaries will provide a vital evidence base for global food marketers and public health advocates to localize their green food promotion strategies, ensuring that interventions are culturally resonant and institutionally appropriate.

Third, the dynamic properties of the model can be theorized through longitudinal and experimental designs that move beyond static relationships. The cross-sectional design captures relationships at a single point in time, leaving unanswered questions about how the model's structure evolves over time or in response to external events. A theoretically motivated longitudinal extension would model how the relative weight of subjective versus objective knowledge shifts following exogenous shocks—such as food safety incidents, policy communication, or media campaigns—thereby testing a dynamic theory of belief formation in which different knowledge types assume temporal primacy depending on the salience of recent information. Similarly, experimental designs can be deployed to test causal hypotheses about the mechanisms underlying cues to action. For instance, experiments could manipulate cue format (e.g., certification explanations versus benefit-focused messages versus threat-based risk communication) to determine which informational formats most effectively activate belief structures, and whether effects are mediated by changes in perceived benefits versus perceived severity. This would extend theory by specifying the causal logic of cues to action—a construct that remains theoretically underspecified as either a simple behavioral trigger or a mechanism that gradually reshapes underlying beliefs. Looking forward, unpacking these dynamic causal mechanisms will equip regulatory bodies with agile risk communication strategies, enabling them to swiftly restore consumer confidence and guide dietary transitions in the aftermath of public health or food safety crises.

Fourth, construct refinement offers a pathway to theoretical precision through improved measurement. The present study operationalized perceived barriers as a unitary construct capturing price concerns, label confusion, and authenticity doubts. A theory-driven measurement extension would disaggregate perceived barriers into finer-grained theoretical dimensions—such as economic barriers (price, affordability), informational barriers (label comprehension, verification effort), access barriers (availability,

convenience), and trust barriers (certification credibility, regulatory confidence)—and test whether each operates through distinct theoretical pathways (e.g., directly inhibiting behavior versus weakening the belief–behavior translation). This would refine theoretical accounts of how barriers function in the model, moving beyond the current conceptualization of barriers as a single deterrent to a more nuanced understanding of their differential roles. Likewise, objective knowledge measures can be expanded to capture distinct knowledge domains (e.g., certification literacy, procedural knowledge, risk interpretation skills), allowing future research to test which knowledge types most strongly influence perceived benefits versus perceived risk—a theoretical distinction that remains underspecified. From an applied perspective, this granular measurement approach will prospectively guide the green food industry in systematically dismantling structural market barriers, allowing for more precise product positioning, pricing strategies, and label designs.

Fifth, the theoretical role of cues to action can be deepened by investigating their source, format, timing, and repetition effects. The present study established that cues to action exert a direct influence on behavior, but the theoretical mechanisms underlying this effect remain underexplored. A theoretically motivated extension would distinguish cues by their source (e.g., expert versus peer versus institutional), format (e.g., informational versus emotional versus social normative), and temporal placement (e.g., immediate point-of-purchase versus pre-decision exposure) to test competing theoretical accounts of how cues operate—whether as triggers that activate existing beliefs, as signals that reduce uncertainty, as mechanisms that enhance perceived benefits, or as reminders that overcome habit inertia. This line of inquiry would also examine whether repeated cue exposure gradually reshapes underlying belief structures (suggesting a learning mechanism) or merely produces transient behavioral effects (suggesting a priming mechanism). Clarifying these theoretical alternatives would refine the model by specifying the causal processes through which external information environments bridge the gap between internal beliefs and actual consumption decisions. In an increasingly digitalized food retail environment, such theoretical clarity will pave the way for future research on algorithmic and point-of-sale nudging, offering actionable blueprints for constructing choice architectures that seamlessly facilitate sustainable food choices.

Taken together, these theory-driven extensions collectively aim to transform the present framework—which offers a focused account of knowledge–belief–behavior relationships—into a more comprehensive, dynamic, and contextually specified theory of green food consumption. By pursuing these directions, future research can move beyond empirical replication toward theoretical refinement, specifying the conditions, mechanisms, and boundary parameters that determine when and how knowledge translates into protective dietary behavior. Ultimately, the overarching prospect of this research agenda is to bridge the persistent intention-behavior gap in sustainable consumption. By charting these theoretical frontiers, future scholarship can provide the robust scientific foundation necessary to drive a broader societal transition toward sustainable, safe, and health-promoting food systems, aligning individual dietary choices with global public health and environmental goals.

5.4 Conclusion

The present study develops an integrated explanation of how subjective knowledge, objective knowledge, health beliefs, and cues to action jointly shape green food consumption behavior among Chinese women. Rather than supporting a simple direct knowledge-to-behavior route, the findings indicate that knowledge operates through a structured belief system composed of perceived benefits, perceived barriers, perceived susceptibility, and perceived severity, while cues to action function as a near-end trigger that helps translate latent concerns into observable purchasing responses. In a consumption context where certification credibility and food safety salience remain central, green food choices are better understood as outcomes of belief-based appraisal and situational activation, not as automatic products of knowing more.

All four research objectives have been addressed through this mechanism-oriented framework. First, subjective knowledge and objective knowledge are empirically distinguishable forms of consumer knowledge, and they contribute to green food consumption through different psychological routes. Objective knowledge reflects consumers' factual understanding of certification and product attributes and thus strengthens more analytic evaluations of advantages and threats, whereas subjective knowledge reflects perceived familiarity and confidence in one's own understanding and therefore shapes how consumers interpret the meaning and personal relevance of green

food information. Second, the pathways from knowledge to health beliefs are clarified in a way that extends common applications of the knowledge attitude behavior tradition and the health belief model. Knowledge does not merely raise awareness in a general sense, but selectively reshapes benefit appraisal, threat appraisal, and barrier appraisal, providing a more fine-grained account of how belief formation occurs in a certification-based sustainable consumption domain. Third, the results confirm that health beliefs and cues to action jointly explain consumption behavior. The belief system operates as an internally differentiated structure in which benefit and threat perceptions motivate protective choice, barriers constrain behavioral translation, and cues to action provide timely informational stimulation that activates purchase decisions in real settings. Fourth, education level and household income are associated with meaningful variation in women's green food consumption behavior, reflecting the role of informational capacity and resource affordability in enabling protective choices, whereas age and marital status do not demonstrate robust explanatory power in this sample.

These conclusions generate several theoretical contributions. The study refines the conceptualization of consumer knowledge in behavioral models by demonstrating the complementary roles of subjective and objective knowledge and by showing that their influence is expressed primarily through belief-based appraisal rather than direct behavioral conversion. It also advances the application of the health belief model by highlighting that perceived benefits, perceived susceptibility, perceived severity, and perceived barriers do not operate as a homogeneous block, but form differentiated channels that jointly structure certification-oriented green consumption. In addition, the study clarifies the theoretical status of cues to action as a proximal activation mechanism, showing that informational prompts from the surrounding communication environment can convert belief readiness into concrete purchasing behavior. By situating these mechanisms within the Chinese green food certification context, and within households where women often assume primary responsibility for food purchasing in a food safety sensitive environment, the study extends existing theories to a setting where risk appraisal, credibility judgment, and situational prompts become particularly salient.

Practical implications follow directly from the mechanism established in the model. For green food enterprises and retailers, interventions should not rely on broad "knowledge popularization" alone, but should align product communication with belief

formation by making benefits concrete, risk reduction credible, and purchasing steps cognitively simple. For regulators and certification bodies, improving label clarity, strengthening authenticity verification, and reducing consumer confusion can directly weaken perceived barriers that prevent belief from translating into action. For health and food safety agencies as well as community educators, well-timed cues to action delivered through trusted channels can activate existing beliefs at key decision moments, especially when paired with concise explanations of certification meaning and health relevance. When accurate knowledge provision, barrier reduction, and situational cues are coordinated, consumers are more likely to convert belief-based motivation into stable protective purchasing patterns that support household well-being and the sustainable development of the food system.

Several limitations should be acknowledged when interpreting these conclusions. The study relies on cross-sectional survey data and self-reported measures, which restrict causal inference and may be influenced by recall bias or social desirability. The sample focuses on women in specific urban settings within China's green food market, which may limit generalizability to rural consumers, male consumers, or populations operating under different certification and risk environments. Future research can strengthen explanatory scope by adopting longitudinal or experimental designs, incorporating behavioral trace indicators such as purchase records, and extending the integrated framework to more diverse populations or additional sustainable food categories. Such work would provide deeper insight into how knowledge structures, belief patterns, and cues to action evolve over time and under changing institutional conditions.

Overall, the study advances both theory and practice by demonstrating how dual-dimensional knowledge, differentiated health beliefs, and external informational cues converge to explain green food consumption behavior among Chinese women. The integrated model clarifies why knowledge may fail to produce sustainable behavior when appraisal and barrier mechanisms are not aligned, and it identifies the specific belief channels and activation conditions through which knowledge can successfully support protective and responsible food choices.

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APPENDIXES

APPENDIX A

Questionnaire (English Version)

Appendix A. Questionnaire (English Version)

Rattanakosin International College of Creative Entrepreneurship

Of Rajamangala University of Technology, Rattanakosin

Questionnaire Examining the Role of Knowledge in Affecting Green Food Consumption Behavior Among Women Consumers from Beijing City, China

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Hello! I am a PhD candidate at Rajamangala University of Technology Rattanakosin in Thailand. I am currently conducting a research study titled "Examining the Role of Knowledge in Affecting Green Food Consumption Behavior Among Women Consumers from Beijing City, China"

Thank you very much for taking the time to participate in this survey!

The purpose of this questionnaire is to better understand your intention to purchase green food. It will take approximately 10 minutes to complete. Please read each question carefully and answer based on your actual experience and personal perceptions. Your honest responses and valuable insights are greatly appreciated.

Please note the following:

This survey is anonymous, and all responses will be used solely for academic research purposes. Your personal information will not be disclosed to any third party.

There are no right or wrong answers. Please respond truthfully according to your actual situation.

In this study, green food refers to high-quality, safe, non-polluted, and nutritious food that is produced in accordance with specific production standards, adheres to principles of sustainable development, and is certified by an authorized institution with a green food label.

Your participation is entirely voluntary, and you may withdraw at any time. Once again, thank you for your support and contribution to this research.

Note: This survey is specifically for female participants aged 20–60. If you do not meet this requirement, please do not continue.

Part I Basic personal information

1. Do you currently live in Beijing?

☐ Yes

☐ No (If selected, the survey will automatically end)

2. Your Gender:

☐ Male (If selected, the survey will automatically end)

☐ Female

3. Have you heard of green food before?

☐ No, I have never heard of it (If No, please skip to the end of the questionnaire and submit your responses.)

☐ Yes, but I don't understand it

☐ Yes, and I know a little about it

☐ Yes, and I know it fairly well

☐ Yes, and I understand it very well

4. Have you ever purchased green food products?

☐ Yes

☐ No (If selected, the survey will automatically end)

☐ Not sure / Don't remember(If selected, the survey will automatically end)

5. Your Age:

☐ 20–29 ☐ 30–39

☐ 40–49 ☐ 50–60

6. Your Average Monthly Income (RMB)(total monthly income divided by the number of family members):

☐ Below 2,000 ☐ 2,001–4,000

☐ 4,001–6,000 ☐ 6,001–8,000

☐ 8,001–10,000 ☐ 10,001–15,000

☐ 15,001–20,000 ☐ 20,001–30,000

☐ above 30,000

7. Your Education Level:

☐ Junior High School or below ☐ High School

☐ University (Bachelor's degree) ☐ Master's degree or above

8. Your Marital Status:

☐ Single ☐ Married

☐ Divorced ☐ Widowed

Part II Purchasing Situation of Green Food

Green food refers to safe, high-quality edible agricultural products and related products that are produced in a good ecological environment, comply with green food production standards, follow whole-process quality control, and are certified to use the green food label.

9. Through which channels do you usually obtain information about green food? (Multiple answers allowed)

☐ Short video platforms (e.g., TikTok/Douyin, Kuaishou)

☐ Social media apps (e.g., WeChat Moments, Xiaohongshu, Weibo)

☐ Online search engines or Q&A platforms (e.g., Baidu, Zhihu)

☐ WeChat official accounts or mini programs

☐ E-commerce platforms (e.g., JD.com, Taobao, Pinduoduo)

☐ Community group chats or neighborhood WeChat groups

☐ Supermarkets or physical retail stores

☐ Friends, family members, or colleagues

☐ TV programs or documentaries

☐ Health-related apps or platforms (e.g., Ping An Health, Keep)

☐ Other (please specify): _____

10. If you have purchased, what is your primary purpose for buying green food?

☐ Almost entirely for daily consumption by myself or my family

☐ Almost entirely as gifts for relatives and friends

☐ Both (both for daily consumption and for gift-giving)

11. Who ends up eating the green food you purchase?

☐ Myself ☐ My family (e.g., spouse, parents)

☐ The children in my household ☐ Other people (as gifts)

☐ A mix of the above (no primary consumer)

12. What factors do you consider when purchasing green food? (Multiple choices allowed)

☐ Healthier ☐ More affordable price

☐ Less environmental impact ☐ Better taste

☐ More nutritious ☐ Others: _____

Part III Subjective Knowledge Scales

To measure the constructs described above, a structured questionnaire was developed using a seven-point Likert scale to assess the degree of respondents' agreement with each statement. The Likert scale is defined as follows:

Note: 1= completely disagree, 2= very disagree, 3= a little disagree, 4= not sure, 5= a little agree, 6= very agree, 7= completely agree

(Please select the score that suits you)

NO.	Items	1	2	3	4	5	6	7
SK1	In comparison with an average person, I know a lot about green food.							
SK2	I know a lot about how to judge the quality of green food.							
SK3	People who know me consider me as an expert in the field of green food.							

Part IV Objective Knowledge Scales

(Please select the score that suits you)

NO.	Items	1	2	3	4	5	6	7
OK1	Green food is produced using minimal synthetic pesticides and chemical fertilizers.							
OK2	Green food is environmentally friendly.							
OK3	Green farming is the same as natural/traditional farming.							
OK4	Green farming has strictly controlled production systems.							
OK5	Green food doesn’t contain Genetically Modified Organisms (GMOs).							

Part V Green Food Consumption Behavior Scales

(Please select the score that suits you)

NO.	Items	1	2	3	4	5	6	7
GCB1	I always buy green food.							
GCB2	I always try to find food with green labeling marks.							
GCB3	I buy green food even with higher prices.							
GCB4	I recommend green food that I consumed to my relatives and friends.							

Part VI Perceived Benefits Scales

(Please select the score that suits you)

NO.	Items	1	2	3	4	5	6	7
PB1	I believe green food is beneficial to my health.							
PB2	I believe green food prevents diseases.							
PB3	It is a good decision to buy green food.							
PB4	The labelling of green helps me make good choices.							
PB5	I believe that eating green food is good for my health.							
PB6	Green food is one of the most essential things for my health.							

Part VII Perceived Barriers Scales

(Please select the score that suits you)

NO.	Items	1	2	3	4	5	6	7
PBA1	I have no control over the food to eat at home.							
PBA2	I have no idea of how much food I should eat.							
PBA3	I do not know the kind of food that is healthy for me.							
PBA4	It is hard to find time to eat healthy food.							
PBA5	I find it difficult to choose green foods when with family/friends.							

Part VIII Perceived Susceptibility Scales

(Please select the score that suits you)

NO.	Items	1	2	3	4	5	6	7
PS1	I am worried about buying food products that might be contaminated with harmful substances							
PS2	Due to food safety issues, I am concerned about purchasing food with chemical residues.							
PS3	I worry that consuming problematic food poses a threat to my health							

Part IX Perceived Severity Scales

(Please select the score that suits you)

NO.	Items	1	2	3	4	5	6	7
PSV1	I worry about buying problematic food poses a threat to health							
PSV2	I concerned that eating problematic food may threaten life and health							
PSV3	Do you think that damage to family health due to long-term consumption of problematic food?							

Part X Cues to Action Scales

(Please select the score that suits you)

NO.	Items	1	2	3	4	5	6	7
CA1	I would be more willing to purchase green food if it were recommended by a food expert or nutritionist							
CA2	I would be more willing to purchase green food if my friends or family members mentioned it.							
CA3	I would be more willing to purchase green food if I read relevant information in the mass media.							

APPENDIX B

Questionnaire (Chinese Version)

Appendix B. Questionnaire (Chinese Version)



拉达那哥欣国际创意创业学院

拉加曼加拉理工大学拉达那科欣

知识对北京女性消费者绿色食品消费行为的影响研究

大家好！我是泰国拉贾曼加拉理工大学的博士研究生，目前正在开展一项名为《探究知识对中国北京女性消费者绿色食品消费行为的影响》的研究项目。

衷心感谢您抽出宝贵时间参与本次调查！

本问卷旨在深入了解您购买绿色食品的意愿。填写时间约为 10 分钟。请仔细阅读每个问题，并根据您的实际体验和个人感受作答。我们非常感谢您提供的诚实反馈和宝贵见解。

请注意以下事项：

本调查为匿名调查，所有反馈将仅用于学术研究目的。您的个人信息不会向任何第三方披露。

没有对错答案，请根据实际情况如实回答。

本研究中，绿色食品指符合特定生产标准、遵循可持续发展原则，并经授权机构认证并带有绿色食品标签的高质量、安全、无污染且营养丰富的食品。

您的参与完全出于自愿，且可随时退出。再次感谢您对本研究的支持与贡献。

注：本调查专为20-60岁女性参与者设计。若您不符合该条件，请勿继续参与。

第一部分 个人基本信息

1. 您是否长期生活在北京?

☐ 是

☐ 否（若选择此选项，调查将自动结束）

2. 性别:

☐ 男（若选择此选项，调查将自动结束）

☐ 女

3. 你听说过绿色食品吗?

☐ 否，我从未听说过（如否，请跳至问卷末尾并提交您的回答。）

☐ 是，但我不理解

☐ 是，我对这方面略知一二

☐ 是，我对此相当了解

☐ 是，我非常了解

4. 你是否购买过绿色食品?

☐ 是

☐ 否（若选择此选项，调查将自动结束）

☐ 不确定/不记得（若勾选，调查将自动结束）

5. 年龄:

☐ 20 - 29　　☐ 30 - 39

☐ 40 - 49　　☐ 50 - 60

6. 您的平均月收入（人民币）（总月收入除以家庭成员人数）：

☐ 少于 2,000　　☐ 2,001 - 4,000

☐ 4,001 - 6,000　　☐ 6,001 - 8,000

☐ 8,001 - 10,000　　☐ 10,001 - 15,000

☐ 15,001 - 20,000　　☐ 20,001 - 30,000

☐ 高于 30,000

7. 受教育水平：

☐ 初中及以下　　☐ 高中

☐ 大学（学士学位）　　☐ 硕士及以上学历

8. 婚姻状况：

☐ 单身　　☐ 已婚

☐ 离异　　☐ 丧偶

第二部分 绿色食品的采购现状

绿色食品是指在良好生态环境中生产、符合绿色食品生产标准、实施全过程质量控制并获得绿色食品认证的优质安全农产品及相关产品。

9. 您通常通过哪些渠道获取绿色食品信息？（可多选）

☐ 短视频平台（例如 TikTok、抖音、快手）

☐ 社交媒体应用（如微信朋友圈、小红书、微博）

☐ 在线搜索引擎或问答平台（如百度、知乎）

☐ 微信公众号或小程序

☐ 电子商务平台（如京东、淘宝、拼多多）

☐ 社区群聊或邻里微信群

☐ 超市或实体零售店

☐ 朋友、家人或同事

☐ 电视节目或纪录片

☐ 健康相关应用程序或平台（如平安健康、Keep）

☐ 其他（请说明）：_____

10.如果您购买了绿色食品，那么您购买的主要目的是什么？

☐ 几乎全部用于本人或家属的日常消费

☐ 几乎全部作为礼物送给亲友

☐ 两者皆可（适用于日常消费及赠礼）

11.最终食用所购绿色食品的主体?

☐ 本人　　☐ 我的家人（如配偶、父母）

☐ 我的孩子们　　☐ 其他人（作为礼物）

☐ 上述混合（无主要消费者）

12. 您在购买绿色食品时会考虑哪些因素？（允许多选）

☐ 健康　　☐ 价格更加实惠

☐ 环境影响更小　　☐ 味觉改善

☐ 更有营养　　☐ 其他：_____

第三部分 主观知识量表

为测量上述构念，本研究采用七点李克特量表设计结构化问卷，用于评估受访者对各陈述的认同程度。李克特量表定义如下:

注：1=完全不同意，2=非常不同意，3=稍不同意，4=不确定，5=稍同意，6=非常同意，7=完全同意（请选择适合您的评分）

NO.	项目	1	2	3	4	5	6	7
SK1	与其他相比，我对绿色食品了解较多。							
SK2	我非常了解如何判断绿色食品的质量。							
SK3	认识我的人都认为我是绿色食品领域的专家。							

第四部分 客观知识量表（请选择适合您的评分）

NO.	项目	1	2	3	4	5	6	7
OK1	绿色食品在生产过程中尽量减少合成农药和化学肥料的使用。							
OK2	绿色食品是环保食品。							
OK3	绿色农业等同于自然/传统农业。							
OK4	绿色农业实行严格的生产制度。							
OK5	绿色食品不含转基因生物（GMOs）。							

第五部分 绿色食品消费行为量表（请选择适合您的评分）

NO.	项目	1	2	3	4	5	6	7
GCB1	我经常购买绿色食品。							
GCB2	我总是尽量寻找带有绿色标签的食品。							
GCB3	即使价格较高，我也购买绿色食品。							
GCB4	我向亲友推荐了自己消费过的绿色食品。							

第六部分 感知收益量表（请选择适合您的评分）

NO.	项目	1	2	3	4	5	6	7
PB1	我认为绿色食品有益于我的健康。							
PB2	绿色食品可以预防疾病。							
PB3	购买绿色食品是明智之举。							
PB4	绿色食品的标签有助于我做出明智的选择。							

NO.	项目	1	2	3	4	5	6	7
PB5	我认为食用绿色食品有益于健康。							
PB6	绿色食品是维护我健康的重要因素之一。							

第七部分 感知障碍量表（请选择适合您的评分）

NO.	项目	1	2	3	4	5	6	7
PBA1	在家中我无法自主决定所吃的食物。							
PBA2	我完全不清楚自己应该摄入多少食物。							
PBA3	我不清楚哪种食物对我健康有益。							
PBA4	我很难抽出时间吃健康食品。							
PBA5	与家人或朋友共处时，选择绿色食品比较困难。							

第八部分 感知易感性量表（请选择适合您的评分）

NO.	项目	1	2	3	4	5	6	7
PS1	我担心购买可能含有有害物质的食品。							
PS2	由于食品安全问题，我担心购买含有化学残留的食品。							
PS3	我担心食用问题食品会对我的健康构成威胁。							

第九部分 感知严重程度量表（请选择适合您的评分）

NO.	项目	1	2	3	4	5	6	7
PSV1	我认为购买有问题的食品会对健康造成威胁。							
PSV2	我担心食用问题食品可能危及生命和健康。							
PSV3	您认为长期使用问题食品会对家庭健康造成损害吗？							

第十部分 行动线索量表（请选择适合您的评分）

NO.	项目	1	2	3	4	5	6	7
CA1	若绿色食品获得食品专家或营养师推荐，我将更倾向于购买。							
CA2	如果亲友推荐，我更愿意购买绿色食品。							
CA3	若能通过大众媒体获取相关信息，我将更倾向于购买绿色食品。							

APPENDIX C

Publication of Journal during Ph.D. Study

APPENDIX C. Publication of Journal during Ph.D. Study

ORIGINAL RESEARCH ARTICLE

Understanding women's green food consumption in Beijing: Integrating knowledge–attitude–behavior and health belief models

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Abstract

Promoting women's green food consumption contributes to SDGs 3, 5, 12, and 13. This study investigates how women in Beijing translate knowledge into certified green food consumption via health belief pathways. We surveyed 676 female consumers (aged 20-60) using purposive and quota sampling across various retail venues. Structural equation modeling (SEM) tested the proposed model. Results indicate that both subjective and objective knowledge significantly increase perceived benefits, susceptibility, and severity, while reducing perceived barriers. However, neither knowledge form directly affects consumption behavior. Instead, behavior is driven by health belief constructs, with cues to action also being a significant predictor. Furthermore, income and education level positively influence green food consumption. These findings theoretically enrich the discussion by integrating the Knowledge Attitude Behavior model with the Health Belief Model and distinguishing knowledge types. We also offer practical guidance for policymakers, certification bodies, retailers, and health educators aiming to promote safer, more sustainable food consumption. *(Afr J Reprod Health 2025; 29 [12s]: 65-85).*

Keywords: Green food consumption; subjective knowledge; objective knowledge; Health Belief Model; Chinese women consumers

Résumé

La promotion de la consommation alimentaire verte des femmes contribue aux ODD 3, 5, 12 et 13. Cette étude examine comment les femmes à Pékin traduisent leurs connaissances en consommation certifiée d'aliments verts via les voies des croyances en matière de santé. Nous avons interrogé 676 consommatrices (âgées de 20 à 60 ans) en utilisant un échantillonnage raisonné et par quota dans divers points de vente. La modélisation par équations structurelles (SEM) a testé le modèle proposé. Les résultats indiquent que les connaissances subjectives et objectives augmentent significativement les avantages perçus, la susceptibilité perçue et la sévérité perçue, tout en réduisant les barrières perçues. Cependant, aucune forme de connaissance n'affecte directement le comportement de consommation. Ce dernier est plutôt motivé par les constructions des croyances en matière de santé, les incitations à l'action étant également un prédicteur significatif. De plus, le revenu et le niveau d'éducation influencent positivement la consommation d'aliments verts. Ces résultats enrichissent théoriquement la discussion en intégrant le modèle Connaissance-Attitude-Comportement au Modèle des Croyances en matière de Santé et en distinguant les types de connaissances. Nous proposons également des conseils pratiques aux décideurs politiques, aux organismes de certification, aux détaillants et aux éducateurs en santé qui visent à promouvoir une consommation alimentaire plus sûre et plus durable. *(Afr J Reprod Health 2025; 29 [12s]: 65-85).*

Mots-clés: Consommation d'aliments verts, connaissances subjectives, connaissances objectives, Modèle des Croyances en matière de Santé, consommatrices chinoises

Introduction

Global food systems are under increasing pressure to deliver diets that are at once safe, healthy, and environmentally sustainable. Traditional high-input agricultural models have significantly expanded food supply, but they also have intensified problems such as resource overuse, environmental degradation, and food safety risks[1]. In response, the international community has promoted the notion of sustainable food, which emphasizes environmental protection, economic viability, and social equity across the entire chain from production to consumption[2]. Within this broader agenda, green and organic food have emerged as tangible pathways to operationalize sustainable

consumption. China has become an important arena for the development of sustainable food systems. Since the early 1990s, the country has established a multi-level certification framework that distinguishes among green food, organic food, and other quality labels, and has integrated these schemes into national strategies for food safety and ecological agriculture[3]. Green food, as officially defined in China, refers to agricultural and processed products produced under restricted use of synthetic pesticides and fertilizers, with regular quality inspection and environmental protection requirements, and it can be identified through the official green food certification logo on the package[4]. According to recent statistics from the China Green Food Development Center (CGFDC), Chinese domestic sales of green food reached 585.657 billion RMB in 2023, more than five times the sales of organic food in the same period, indicating that green food has moved beyond a niche market and is increasingly embraced by mainstream consumers[5].

However, rapid market expansion does not imply that consumers' purchasing behavior is stable or sufficient to support a long-term transformation of food systems. Existing research consistently shows that green and sustainable food markets are constrained by multiple factors, including higher prices, information asymmetry, and limited trust in certification standards[6]. In the specific case of China, the certification system is complex and multi-tiered, with AA-grade and A-grade green food coexisting alongside organic labels and loosely regulated claims such as "ecological" or "natural" food[7]. Many consumers struggle to distinguish among these categories, and official certification marks compete with commercial labels on supermarket shelves and digital platforms. This situation creates confusion, reinforces perceived risk, and contributes to a persistent "attitude–behavior gap," where positive attitudes toward green food do not consistently translate into actual purchasing behavior[8].

Chinese women are at the center of these dynamics. In most urban households, women remain the primary decision-makers for food purchasing and meal preparation, and thus directly shape family dietary patterns[9]. At the same time, they often carry a culturally rooted responsibility for safeguarding the health of children, partners, and elderly relatives, which heightens their sensitivity to food safety issues[10].

From the perspective of the Health Belief Model (HBM), their decisions about whether to purchase green food are influenced by perceived susceptibility to foodborne risks, perceived severity of potential health consequences, perceived benefits of choosing certified products, and perceived barriers related to cost, availability, or social norms[11]. In a context where foodborne diseases still pose important public health challenges and where pesticide residues, chemical additives, and pathogenic contamination remain salient concerns, these health beliefs exert substantial influence on women's food choices[12].

Yet, even among health-conscious, better-educated female consumers in urban China, green food consumption is marked by inconsistency. Many women report strong support for "healthy" or "safe" eating and express a desire to protect their families through better food choices, but their actual purchasing of certified green products is often sporadic[13]. One key reason lies in the structure of consumer knowledge. Recent research distinguishes between subjective knowledge, meaning self-perceived familiarity and confidence, and objective knowledge, meaning accurate, verifiable understanding based on expert-defined standards[14, 15]. In China's green food market, a frequent pattern is high subjective but low objective knowledge: consumers believe they know what "green food" is, yet they confuse general "green" marketing terms with officially certified green food, mistake "ecological farm" branding for formal certification by the China Green Food Development Center, or trust unverified "green" products promoted on social media and short-video platforms[16]. Under these conditions, strong health beliefs may fail to translate into stable, certification-consistent purchasing behavior because the cognitive foundations of decision-making are flawed.

These practical challenges are mirrored by several theoretical limitations in the existing literature. First, most studies of green or organic food consumption adopt a single theoretical lens, typically either the Knowledge–Attitude–Behavior (KAB) model or the Health Belief Model. KAB

emphasizes a linear cognitive sequence from knowledge to attitude to behavior, and has been widely applied in food and nutrition education research[17,18]. HBM, by contrast, highlights health-related motivations such as perceived susceptibility, perceived severity, perceived benefits, and perceived barriers, and has been used to explain preventive behaviors like vaccination uptake or healthy eating[19]. Only a few studies have attempted to integrate these perspectives, even though real-world food choices often involve both rational information processing and emotionally charged health concerns[20, 21].

Second, within the KAB framework, "attitude" is frequently treated as a broad evaluative disposition, which provides limited insight into why and how individuals are motivated to act. The multidimensional nature of health-related attitudes, especially in relation to perceived risks and perceived barriers, is often overlooked. Recent works suggest that the constructs of the HBM can be used to unpack and operationalize this attitude component, but empirical applications in the context of green food remain scarce [21]. Third, although the distinction between subjective and objective knowledge is gaining attention in consumer research, many studies still treat knowledge as a single-dimensional construct, thereby obscuring how confidence and factual accuracy may exert different, and sometimes opposing, effects on sustainable food choices[14, 15].

In order to address these gaps, the present study focuses on Chinese women as key household food decision-makers in Beijing and investigates how their subjective and objective knowledge of green food influence health beliefs and consumption behavior. Specifically, this study pursues four objectives.

1)To investigate the impact of subjective knowledge and objective knowledge on Chinese women's green food consumption behavior.

2)To analyze the influence pathways of subjective knowledge and objective knowledge on health beliefs (perceived benefits, perceived barriers, perceived susceptibility, perceived severity).

3)To evaluate the effects of health beliefs (perceived benefits, perceived barriers, perceived susceptibility, perceived severity) on Chinese women's attitudes toward green food consumption.

4)To examine how demographic factors (marital status, education level, and household income, age) shape Chinese women's green food consumption behavior.

Literature review

Theoretical framework

This study adopts an integrated framework combining the Knowledge–Attitude–Behavior (KAB) model and the Health Belief Model (HBM). KAB suggests that knowledge shapes evaluative tendencies and ultimately behavior, and it has been widely applied in food choice, nutrition education, and sustainable consumption research[17]. Yet, treating knowledge as a single-dimensional construct and attitude as a generic evaluation is often insufficient in credibility-sensitive contexts such as food safety and certification, where consumers face complex signals and heterogeneous labelling practices. In green food markets, it is therefore necessary to distinguish objective knowledge (accurate, fact-based understanding) from subjective knowledge(self-perceived familiarity and confidence) [14, 15]. Integrating KAB with HBM reframes the classic knowledge→attitude→behavior chain into a more diagnostic pathway: knowledge→health beliefs→behavior—capturing the psychological mechanisms that underpin risk-averse, protective food choices.

Hypothesis development

Objective knowledge reflects verifiable understanding of product attributes, production processes, and certification standards; it improves consumers' ability to interpret certification cues, discriminate credible claims from vague slogans, and reduce ambiguity in decision-making [14]. Empirical work shows that factual knowledge increases recognition of certified labels and preference for verified products [22], strengthens confidence in sustainability-related decisions [23], supports more stable pro-health/pro-environment purchasing patterns [24], increases attention to certification symbols in real purchase contexts[25], and promotes healthier choices under uncertainty [26].

H1: Consumers with higher levels of objective knowledge about green food are more likely to engage in green food consumption behavior.

Subjective knowledge captures perceived familiarity and self-assessed expertise, which may motivate protective consumption even when factual accuracy varies[27]. Perceived familiarity with sustainability attributes increases preferences for eco-labelled foods [28]; subjective knowledge reinforces expected nutritional benefits and protective eating choices[29], reduces uncertainty and increases willingness to pay for certified products [30], and supports precautionary behavior when market information is complex [31]. It is also especially influential among primary household food purchasers who rely on perceived expertise to manage safety risks and interpret quality/certification signals[32, 33].

H2: Consumers with higher levels of subjective knowledge regarding green food are more inclined to perform green food consumption behavior.

Beyond direct effects, both knowledge types are expected to shape HBM beliefs. When consumers feel knowledgeable, they tend to value the health/safety/quality advantages of certified foods more strongly[14,32], while experiencing fewer obstacles because confidence reduces confusion, strengthens trust, and enhances control in complex food environments[34,35]. Perceived expertise can also heighten vulnerability and seriousness appraisals by making risks and long-term harm more salient[36].

H3a: Subjective knowledge positively influences perceived benefits of green food.
H3b: Subjective knowledge negatively influences perceived barriers to green food consumption.
H3c: Subjective knowledge positively influences perceived susceptibility to risks associated with non-green food.
H3d: Subjective knowledge positively influences perceived severity of the consequences of unhealthy food consumption.

Similarly, objective knowledge in credibility-sensitive settings can strengthen benefit beliefs by clarifying concrete advantages[37], reduce barriers by improving label interpretation and authenticity assessment[38], heighten susceptibility through better understanding of contamination pathways and exposure[33], and increase severity appraisals by enhancing comprehension of chronic impacts and regulatory gaps[39].

H4a: Objective knowledge positively influences perceived benefits of green food.
H4b: Objective knowledge negatively influences perceived barriers to green food consumption.
H4c: Objective knowledge positively influences perceived susceptibility to risks linked to unhealthy food consumption.
H4d: Objective knowledge positively influences perceived severity of the consequences of unhealthy food consumption.

HBM constructs function as proximal determinants of preventive consumption[40]. Stronger perceived benefits motivate adoption of safer and health-enhancing options, whereas perceived barriers (e.g., price concerns, authenticity doubts, inconvenience) inhibit protective behavior[41]. Higher susceptibility increases readiness to shift toward certified alternatives under perceived food safety threats[42,43], and greater severity strengthens motivation to avoid serious or long-lasting consequences[44].

H5a: Perceived benefits positively influence green food consumption behavior.
H5b: Perceived barriers negatively influence green food consumption behavior.
H5c: Perceived susceptibility positively influences green food consumption behavior.
H5d: Perceived severity positively influences green food consumption behavior.

Consistent with HBM, the effects of knowledge on behavior are expected to operate largely through beliefs. Clear benefit beliefs are a central motivational route: objective knowledge strengthens evidence-based expectations of nutritional value and reduced chemical exposure [45,46], and subjective knowledge similarly amplifies perceived outcome superiority and wellbeing expectations[47].

H6a: Perceived benefits mediate the relationship between objective knowledge and green food consumption behavior.

H6b: Perceived benefits mediate the relationship between subjective knowledge and green food consumption behavior.

Barriers provide another key pathway. Factual literacy helps consumers understand labelling systems and certification procedures, reducing uncertainty, confusion, and perceived effort/cost[16,14,19]; perceived expertise likewise reduces anxiety and strengthens confidence in one's own judgments when navigating ambiguous claims[15]. Hence, we propose:

H7a: Perceived barriers mediate the relationship between objective knowledge and green food consumption behavior.
H7b: Perceived barriers mediate the relationship between subjective knowledge and green food consumption behavior.

Knowledge also influences behavior via perceived vulnerability. Objective knowledge about residues, contamination routes, and regulatory processes supports more accurate exposure assessment [48, 49] and makes risks more concrete, which can raise perceived susceptibility, particularly in uncertified contexts[33]. Subjective knowledge can similarly intensify personalization of food risks and strengthen vulnerability perception as a cognitive channel to action[50,51]. therefore, we posit:

H8a: Perceived susceptibility mediates the relationship between objective knowledge and green food consumption behavior.
H8b: Perceived susceptibility mediates the relationship between subjective knowledge and green food consumption behavior.

Severity appraisal is expected to operate as an additional mechanism. Understanding exposure routes and long-term health effects can heighten seriousness evaluations and motivate safer alternatives[52], while perceived familiarity increases the accessibility and salience of negative consequences[53]. Evidence further suggests that once severity is modeled, direct knowledge effects may weaken while indirect effects via severity remain meaningful[54]. therefore, we posit:

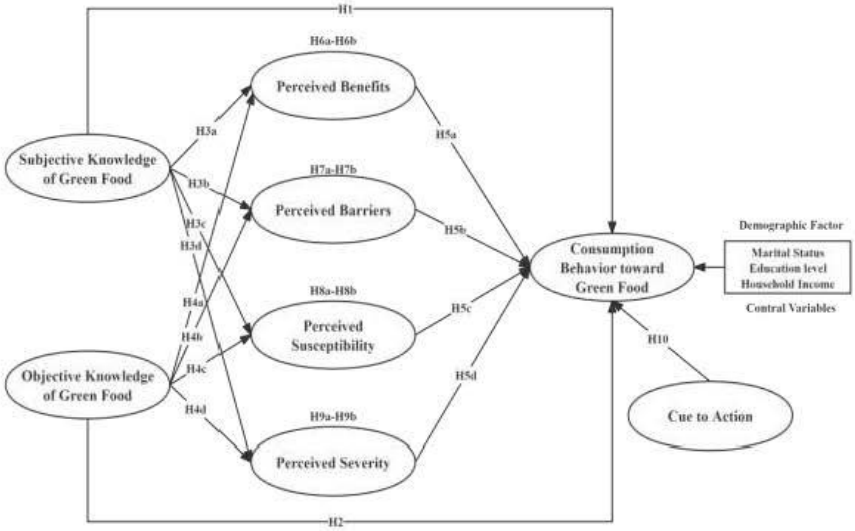

Figure 1: The research model of consumption behavior toward green food

H9a: Perceived severity mediates the relationship between objective knowledge and green food consumption behavior.
H9b: Perceived severity mediates the relationship between subjective knowledge and green food consumption behavior.

Finally, cues to action activate knowledge and beliefs at the decision point and facilitate belief-to-behavior translation[55]. External signals such as government alerts, incident-related news, and campaigns heighten risk salience and encourage certified choices[42], while social media exposure and online health messages operate as powerful prompts for sustainable/health-oriented purchasing[56]. Interpersonal recommendations from family, peers, and health professionals further strengthen intention–behavior consistency[57].

H10: Cues to action positively influence green food consumption behavior.

In sum, the proposed model links objective and subjective knowledge to HBM beliefs and then to green food consumption behavior, with cues to action and demographics as contextual influences (Figure 1).

Methods

Data collection

This study surveyed 676 Chinese female consumers aged 20 to 60 years who lived in Beijing city, China and had previous experience purchasing certified green food. Data were collected using a multi stage sampling strategy that combined quota sampling with purposive sampling. Age based quotas were first set according to the age distribution of women aged 20 to 60 so that the sample structure broadly reflected the population. Within each age quota, trained investigators used screening questions to recruit eligible respondents at large chain supermarkets, community fresh markets, organic food specialty stores and shopping malls where green food is sold. Fieldwork was conducted between September and October 2025. After obtaining informed consent, respondents completed an electronic questionnaire on the Wenjuanxing platform on their own mobile phones or on tablets provided by the research team.

Instrument

The questionnaire consisted of four sections. The first section provided an introduction outlining the study purpose, data confidentiality, and voluntary participation. The second section collected demographic information such as age, education level, marital status, household income, and parenting status. The third section assessed respondents' purchasing behavior and familiarity with green food. The fourth and most substantial section contained measurement scales for seven latent variables.

Each construct was measured using scales adapted from validated instruments published in peer-reviewed journals. Subjective knowledge of green food was assessed with three items adapted from Fatha and Ayoubi[15] to capture consumers' perceived familiarity with green food. Objective knowledge was measured with five factual statements adapted from the same authors, covering production methods, environmental impact, certification, and product attributes. Cues to action were captured with three items adapted from Glick, Winham[40], reflecting the influence of expert recommendations, family and friends, and social media exposure. Perceived benefits and perceived barriers were measured with six and five items, respectively, adapted from Martey[19,58] to assess beliefs about the health advantages of green food and the psychological, accessibility, and cost-related obstacles to its consumption. Perceived susceptibility was measured with three items adapted from Wang, Guo[59], and perceived severity with four items adapted from Wang, Huang[11], both capturing consumers' perceived vulnerability to and seriousness of foodborne health risks. Green food consumption behavior was assessed using four items adapted from Zhu, Li[60], which evaluate the frequency of purchasing, attention to green labels, willingness to pay a premium, and recommendation behaviors. Except for the objective knowledge scale, which used dichotomous scoring (0 for incorrect or "not sure" and 1 for correct responses), all items were rated on a seven-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7).

Data analysis

Data analysis followed several stages. First, completed questionnaires were screened for completeness, logical consistency, and response quality. Cleaned data were coded and entered into SPSS for descriptive statistics, reliability checks, and preliminary validity assessments. Structural equation modeling (SEM) was subsequently conducted using SmartPLS to examine both direct and indirect effects among variables, allowing simultaneous evaluation of the measurement and structural models.

Before the main survey, a pilot study was conducted with 35 respondents who met the study criteria to assess the reliability and validity of the questionnaire. Cronbach's alpha values for all constructs ranged from 0.780 to 0.927, exceeding the recommended threshold of 0.70, indicating strong internal consistency. Kaiser–Meyer–Olkin (KMO) values for all variables were above 0.70, confirming adequate sampling adequacy for factor analysis. These results demonstrate that the measurement scales possessed satisfactory reliability and validity and were suitable for full-scale data collection.

Ethical considerations

This study involved an anonymous questionnaire survey administered to adult participants (aged 18 years or above). Participation was entirely voluntary. Prior to the survey, participants were provided with an information sheet describing the study purpose, procedures, expected time commitment, and data use, and they indicated informed consent before proceeding. No personally identifiable information was collected, and responses were analyzed and reported only in aggregate form to protect privacy and confidentiality. Participants could skip any question and withdraw at any time before submitting the survey without penalty. In accordance with the authors' institutional guidance and relevant local regulations for minimal-risk, anonymous survey research with competent adults, the study was determined to be exempt from formal ethical review; therefore, no ethics committee approval number is available. Nevertheless, the study was conducted in line with established ethical principles for human-subject research, including respect for persons, beneficence, and confidentiality.

Results

Table 1 shows that all 676 respondents had at least heard of green food, with most reporting that they knew it fairly well or very well, which indicates adequate familiarity for examining knowledge related mechanisms. The age structure is relatively even, with the largest share in the 40–49 group and comparable proportions in the 20–29 and 30–39 groups, while respondents aged 50–60 account for a smaller share. Average monthly income is concentrated between RMB 8,001 and 20,000, with fewer respondents at very low or very high income levels, suggesting a predominance of middle income households. In terms of education, over half hold a bachelor degree, about one fifth have a master or doctoral degree, and around one quarter are in the bachelor and below category, showing that the sample is generally well educated rather than dominated by low education groups. For marital status, single and married respondents together account for most of the sample, whereas divorced and widowed women represent only a small minority.

Figure 2 presents a descriptive overview of Chinese female consumers' green food practices across four dimensions: information acquisition, purchase purpose, household sharing, and decision criteria. The upper left panel shows that short video platforms are the most frequently used channel for accessing green food information, followed by social media, search engines, WeChat official accounts and other digital sources, while supermarkets, community spaces and interpersonal recommendations play a supporting but less prominent role. The upper right panel indicates that most respondents buy green food primarily for daily consumption, with smaller groups purchasing mainly as gifts or for both everyday use and gifting. The lower left panel reveals that green food is usually shared within the household rather than consumed by a single person, with mixed family consumption occupying the largest share. The lower right panel shows that health benefits are the dominant consideration when purchasing green food, with taste and nutritional value also highly

Table 1: Sample information

Information and Options		Frequency	Percent (%)
Have you heard of green food before	Yes, but I don't understand it at all	101	14.9
	Yes, and I know a little about it	176	26
	Yes, and I know it fairly well	187	27.7
	Yes, and I understand it very well	212	31.4
Age	20–29	183	27.1
	30–39	187	27.7
	40–49	212	31.4
	50–60	94	13.9
Average Monthly Income (RMB)	2,001–4,000	13	1.9
	4,001–6,000	82	12.1
	6,001–8,000	52	7.7
	8,001–10,000	164	24.3
	10,001–15,000	126	18.6
	15,001–20,000	122	18
	20,001–30,000	74	10.9
	Above 30,000	43	6.4
Education Level	Bachelor's degree and below	176	26
	Bachelor	360	53.3
	Master	120	17.8
	Doctor	20	3
Marital Status	Single	310	45.9
	Married	331	49
	Divorced	25	3.7
	Widowed	10	1.5

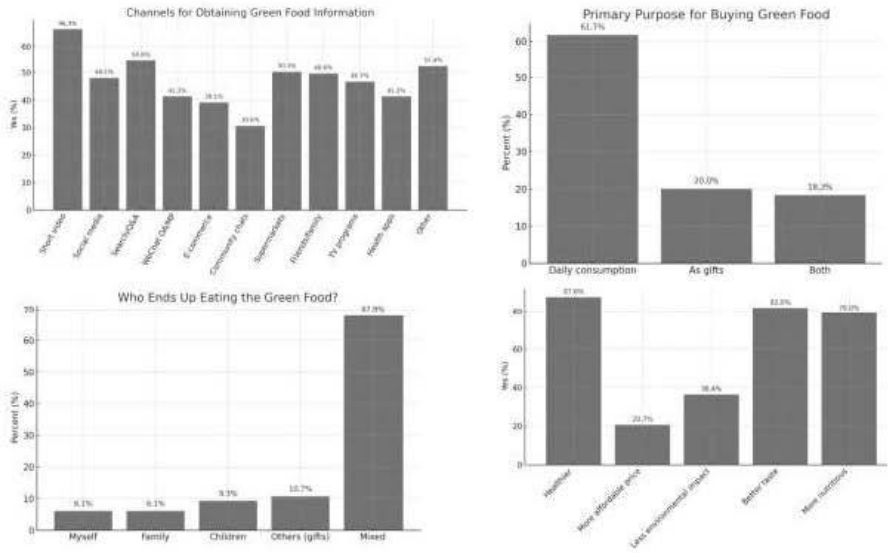

Figure 2: Information channels, household use and decision making in green food consumption

Table 2: Descriptive statistics results

Study variables	Items	Mean	S.D.	Skewness		Kurtosis	
				Value	S.E.	Value	S.E.
Subjective Knowledge	SK1	4.560	1.454	-0.918	0.126	-0.013	0.251
	SK2	4.530	1.420	-0.844	0.126	-0.251	0.251
	SK3	4.570	1.358	-0.896	0.126	-0.065	0.251
Objective Knowledge	OK1	4.540	1.434	-0.879	0.126	-0.363	0.251
	OK2	4.470	1.447	-0.822	0.126	-0.263	0.251
	OK3	4.520	1.438	-0.835	0.126	-0.271	0.251
	OK4	4.490	1.427	-0.966	0.126	0.029	0.251
	OK5	4.530	1.406	-0.910	0.126	-0.102	0.251
Green Food	GCB1	4.460	1.494	-0.752	0.126	-0.464	0.251
Consumption Behavior	GCB2	4.570	1.382	-0.839	0.126	-0.089	0.251
	GCB3	4.530	1.418	-0.839	0.126	-0.218	0.251
	GCB4	4.540	1.395	-0.758	0.126	-0.491	0.251
Perceived Benefits	PB1	4.510	1.468	-0.700	0.126	-0.496	0.251
	PB2	4.580	1.436	-0.859	0.126	-0.108	0.251
	PB3	4.520	1.401	-0.843	0.126	-0.088	0.251
	PB4	4.540	1.438	-0.721	0.126	-0.493	0.251
	PB5	4.530	1.460	-0.711	0.126	-0.578	0.251
	PB6	4.500	1.444	-0.849	0.126	-0.197	0.251
Perceived Barriers	PBA1	3.490	1.414	0.738	0.126	-0.406	0.251
	PBA2	3.380	1.439	0.792	0.126	-0.298	0.251
	PBA3	3.500	1.380	0.717	0.126	-0.454	0.251
	PBA4	3.490	1.410	0.842	0.126	-0.302	0.251
	PBA5	3.430	1.403	0.868	0.126	-0.227	0.251
Perceived	PS1	4.530	1.525	-0.803	0.126	-0.274	0.251
Susceptibility	PS2	4.530	1.372	-0.847	0.126	-0.168	0.251
	PS3	4.540	1.414	-0.890	0.126	-0.154	0.251
Perceived Severity	PSV1	4.500	1.431	-0.831	0.126	-0.308	0.251
	PSV2	4.450	1.494	-0.761	0.126	-0.395	0.251
	PSV3	4.530	1.433	-0.809	0.126	-0.333	0.251
Cues to Action	CA1	4.540	1.373	-0.956	0.126	0.050	0.251
	CA2	4.620	1.398	-0.972	0.126	-0.012	0.251
	CA3	4.530	1.462	-0.856	0.126	-0.373	0.251

salient, whereas environmental impact and affordability are secondary but still relevant concerns. Together, these patterns depict a health oriented and family centred consumption profile embedded in a strongly digital information environment.

Table 2 reports the descriptive statistics for all measurement items used in this study, including mean values, standard deviations, skewness, and kurtosis. Overall, the results indicate that most constructs exhibit relatively high mean scores, generally above 4.4 for subjective knowledge, objective knowledge, perceived benefits, perceived susceptibility, perceived severity, and cues to action, suggesting that respondents tend to express strong agreement or high levels of endorsement across these dimensions. In contrast, items measuring perceived barriers show noticeably lower mean values, clustered around 3.4 to 3.5, indicating that barriers are present but not strongly perceived among most respondents.

The skewness and kurtosis values across items fall within acceptable ranges for SEM-based analyses, with negative skewness for knowledge-related and belief-related constructs reflecting a distribution leaning toward higher scores, while perceived barriers demonstrate positive skewness, consistent with their lower mean levels. Kurtosis values remain close to zero across all items, suggesting relatively normal distributional

Table 3: Measure model fit metrics

Fit index	χ2/df	RMSEA	GFI	AGFI	NFI	TLI	CFI
Reference standards	<3	<0.08	>0.9	>0.9	>0.9	>0.9	>0.9
Result	1.056	0.012	0.931	0.916	0.929	0.995	0.996

Table 4: Convergence validity

Latent variables	Observation indicators	Factor loading	CR	AVE
Subjective Knowledge	SK1	0.759	0.817	0.598
	SK2	0.809		
	SK3	0.751		
Objective Knowledge	OK1	0.813	0.895	0.631
	OK2	0.783		
	OK3	0.776		
	OK4	0.803		
	OK5	0.796		
Green Food Consumption Behavior	GCB1	0.786	0.844	0.576
	GCB2	0.742		
	GCB3	0.753		
	GCB4	0.753		
Perceived Benefits	PB1	0.762	0.897	0.593
	PB2	0.765		
	PB3	0.777		
	PB4	0.756		
	PB5	0.786		
	PB6	0.772		
Perceived Barriers	PBA1	0.789	0.880	0.594
	PBA2	0.741		
	PBA3	0.757		
	PBA4	0.780		
	PBA5	0.785		
Perceived Susceptibility	PS1	0.757	0.804	0.578
	PS2	0.744		
	PS3	0.780		
Perceived Severity	PSV1	0.713	0.787	0.552
	PSV2	0.781		
	PSV3	0.733		
Cues to Action	CA1	0.758	0.845	0.645
	CA2	0.866		
	CA3	0.781		

characteristics and supporting the suitability of the data for subsequent confirmatory factor analysis and structural equation modeling. Together, the descriptive results presented in Table 2 provide an initial overview of respondents' attitudinal patterns and confirm the adequacy of the dataset for further multivariate analysis.

Structural equation model

Confirmatory factor analysis

To evaluate the adequacy of the measurement model, a confirmatory factor analysis was conducted and the resulting fit indices are presented in Table 3. The model demonstrates an excellent overall fit. The ratio of chi-square to degrees of freedom is 1.056, which is well below the commonly accepted upper limit of three, indicating that the model reproduces the observed covariance structure effectively. The RMSEA value of 0.012 is substantially lower than the recommended threshold of 0.08, suggesting a close model fit. In addition, the incremental and absolute fit indices show strong support for the measurement structure. The Goodness-of-Fit Index (GFI) and Adjusted Goodness-of-Fit Index (AGFI) values exceed 0.90,

Table 5: Discriminant validity test

Latent variables	SK	OK	GCB	PB	PBA	PS	PSV	CA
Subjective Knowledge	0.773 ***							
Objective Knowledge	0.426	0.794 ***						
Green Food Consumption Behavior	0.443	0.451	0.759 ***					
Perceived Benefits	0.362	0.422	0.488	0.770 ***				
Perceived Barriers	-0.473	-0.437	-0.474	-0.395	0.771 ***			
Perceived Susceptibility	0.390	0.435	0.543	0.479	-0.373	0.760 ***		
Perceived Severity	0.408	0.505	0.538	0.428	-0.461	0.408	0.743 ***	
Cues to Action	0.396	0.359	0.504	0.339	-0.315	0.441	0.444	0.803 ***

Note: The diagonal is the square root of the corresponding dimension AVE
SK: Subjective Knowledge; OK: Objective Knowledge; GCB: Green Food Consumption Behavior; PB: Perceived Benefits; PBA: Perceived Barriers; PS: Perceived Susceptibility; PSV: Perceived Severity; CA: Cues to Action.
***: P<0.001.

Table 6: Model fit metrics

Fit index	$\chi 2/df$	RMSEA	GFI	AGFI	NFI	TLI	CFI
Reference standards	<3	<0.08	>0.9	>0.9	>0.9	>0.9	>0.9
Result	1.221	0.024	0.915	0.900	0.915	0.982	0.983

Table 7: Direct path effects

Hypothesis	**Path**	**B**	**S.E.**	**C.R.**	**P**	**Results**
H1	SK → GCB	0.048	0.081	0.615	0.539	Non-supported
H2	OK → GCB	0.020	0.072	0.272	0.786	Non-supported
H3a	SK → PB	0.273	0.064	4.301	***	Supported
H3b	SK → PBA	-0.380	0.065	-5.898	***	Supported
H3c	SK → PS	0.305	0.071	4.510	***	Supported
H3d	SK → PSV	0.291	0.062	4.364	***	Supported
H4a	OK → PB	0.331	0.059	5.385	***	Supported
H4b	OK → PBA	-0.293	0.057	-4.910	***	Supported
H4c	OK → PS	0.330	0.064	5.087	***	Supported
H4d	OK → PSV	0.403	0.058	6.083	***	Supported
H5a	PB → GCB	0.166	0.059	2.864	0.004	Supported
H5b	PBA → GCB	-0.156	0.063	-2.510	0.012	Supported
H5c	PS → GCB	0.231	0.064	3.585	***	Supported
H5d	PSV → GCB	0.206	0.077	2.995	0.003	Supported
H10	CA → GCB	0.215	0.065	3.620	***	Supported

Note: SK: Subjective Knowledge; OK: Objective Knowledge; GCB: Consumption Behavior toward Green Food; PB: Perceived Benefits; PBA: Perceived Barriers; PS: Perceived Susceptibility; PSV: Perceived Severity; CA: Cues to Action.
***: p<0.001.

and the Normed Fit Index (NFI), Tucker–Lewis Index (TLI), and Comparative Fit Index (CFI) values are all above 0.92, indicating an acceptable-to-excellent overall and incremental fit.. Taken together, these results confirm that the measurement model has sound psychometric properties and is appropriate for subsequent structural analysis.

To further establish the quality of the measurement model, convergence validity was examined through standardized factor loadings, composite reliability, and average variance extracted. The results, presented in Table 4, show that all latent constructs exhibit satisfactory psychometric performance. Across the eight latent variables, the standardized factor loadings range from approximately 0.71 to 0.86, indicating that each indicator contributes meaningfully to its underlying construct. Composite reliability values exceed the recommended threshold of 0.70 for all constructs, with several surpassing 0.85, reflecting high internal consistency. The average variance extracted values are all above 0.55, demonstrating that each construct explains more than half of the variance in its observed indicators. These findings confirm that the latent variables demonstrate strong convergence validity and are suitable for subsequent structural modeling.

The discriminant validity of the measurement model was assessed using the Fornell–Larcker criterion, with the results presented in Table 5. For each construct, the square root of the average variance extracted appears on the diagonal and exceeds all corresponding inter-construct correlations in the same row and column. This pattern confirms that each latent variable shares greater variance with its own indicators than with any other construct in the model. The correlations among the factors remain within theoretically reasonable ranges, with positive associations observed among knowledge, perceived benefits, susceptibility, severity, and consumption behavior, while perceived barriers show expected negative correlations with most variables [61]. Furthermore, all correlations are statistically significant at the 0.001 level, reinforcing the robustness of the structural relationships. Taken together, these results indicate that the model achieves satisfactory discriminant validity and that the latent constructs are empirically distinct, allowing for reliable testing of the hypothesized pathways in subsequent analyses.

Structural model path analysis

The overall structural model demonstrates an excellent level of fit, as summarized in Table 6. All key indices meet or surpass commonly accepted methodological thresholds, indicating that the hypothesized model adequately reflects the covariance structure of the observed data. The chi-square divided by degrees of freedom is 1.221, well below the recommended upper limit of 3, suggesting minimal discrepancy between the model and the sample covariance matrix. The RMSEA value of 0.024 falls far beneath the 0.08 benchmark, further confirming a close model fit. Additionally, the incremental and absolute fit indices, including GFI (0.915), AGFI (0.900), NFI (0.915), TLI (0.982), and CFI (0.983), all exceed the conventional 0.90 criterion. Together, these results provide robust empirical support for the adequacy of the structural model and justify proceeding with the analysis of hypothesized relationships among the study variables.

Table 7 presents the direct path estimates of the structural model and shows a clear pattern in how the hypotheses are supported. Regarding H3a–H3d, subjective knowledge significantly predicts all four health belief components. Higher subjective knowledge increases perceived benefits, perceived susceptibility, and perceived severity, and reduces perceived barriers, which confirms that H3a, H3c, and H3d are supported while H3b is supported in the negative direction as expected. Similarly, H4a–H4d are all supported: objective knowledge has a positive effect on perceived benefits, perceived susceptibility, and perceived severity, and a negative effect on perceived barriers. These significant paths indicate that both subjective and objective knowledge shape consumers' cognitive evaluations of the advantages of green food, the likelihood of experiencing food related risks, and the seriousness of potential harm, while easing psychological and practical obstacles.

In contrast, H1 and H2 are not supported, because neither subjective knowledge nor objective knowledge has a significant direct effect on green

Table 8: Indirect effect bootstrap analysis

Hypothesis	Mediation path	Effect value	SE	Bias-Corrected 95%CI		Results
				Lower	Upper	
H6a	OK → PB → GCB	0.054	0.03	0.007	0.128	Supported
H7a	OK → PBA → GCB	0.045	0.029	0.001	0.125	Supported
H8a	OK → PS → GCB	0.074	0.036	0.015	0.153	Supported
H9a	OK → PSV → GCB	0.081	0.044	0.015	0.195	Supported
H6b	SK → PB → GCB	0.047	0.029	0.009	0.128	Supported
H7b	SK → PBA → GCB	0.061	0.041	-0.004	0.164	Non-supported
H8b	SK → PS → GCB	0.073	0.036	0.011	0.145	Supported
H9b	SK → PSV → GCB	0.062	0.036	0.010	0.179	Supported

Note: SK: Subjective Knowledge; OK: Objective Knowledge; GCB: Green Food Consumption Behavior; PB: Perceived Benefits; PBA: Perceived Barriers; PS: Perceived Susceptibility; PSV: Perceived Severity; CA: Cues to Action.

Table 9: Total effects

Effect path	Effect size	SE	Bias-Corrected 95%CI	
			Lower	Upper
CA→GCB	0.237	0.096	0.054	0.440
SK→GCB	0.293	0.100	0.116	0.520
OK→GCB	0.273	0.082	0.117	0.442

Note: SK: Subjective Knowledge; OK: Objective Knowledge; GCB: Green Food Consumption Behavior; PB: Perceived Benefits; PBA: Perceived Barriers; PS: Perceived Susceptibility; PSV: Perceived Severity; CA: Cues to Action.

Table 10: Direct path effects

Control variables	Dependent variable	β	S.E.	T	P	Results
Age	GCB	-0.111	0.069	-1.868	0.063	Non-supported
Average monthly income	GCB	0.11	0.046	2.391	0.003	Supported
Education level	GCB	0.17	0.077	2.208	0.001	Supported
Marital status	GCB	-0.022	0.079	-0.348	0.728	Non-supported

Note: GCB: Green Food Consumption Behavior.

food consumption behavior. The non significant coefficients suggest that knowledge alone does not automatically translate into action, and that its influence is channelled mainly through changes in health beliefs rather than through direct behavioral motivation. In line with H5a–H5d, all four health belief constructs show significant direct effects on consumption behavior. Perceived benefits, perceived susceptibility, and perceived severity each increase the likelihood of purchasing green food, whereas perceived barriers reduce it, confirming the deterrent role of financial, cognitive, and accessibility constraints. Finally, H10 is supported, as cues to action exert a significant positive effect on consumption behavior, highlighting the importance of external triggers such as media information, professional advice, and interpersonal recommendations in activating protective food choices. Together, these results indicate that health belief variables provide the main explanatory pathway for the impact of both forms of knowledge, which helps explain why the direct knowledge to behavior hypotheses H1 and H2 are not empirically supported.

Table 8 presents the bootstrap results for the indirect effects and provides clear evidence that most of the proposed mediation pathways are supported. For objective knowledge, all four mediation paths through perceived benefits, perceived barriers, perceived susceptibility, and perceived severity show significant indirect effects on green food consumption behavior. The

confidence intervals for these paths do not include zero, indicating reliable mediation [62]. These findings suggest that objective knowledge influences green food consumption primarily through its effects on health related beliefs, rather than exerting a direct influence on behavior.

Subjective knowledge also demonstrates significant indirect effects through three of the four health belief constructs. The mediation paths involving perceived benefits, perceived susceptibility, and perceived severity all show significant and positive indirect influences on consumption behavior. This pattern confirms that subjective understanding of green food contributes to behavioral engagement by shaping consumers' perceived advantages and health risk evaluations. Only the mediation path through perceived barriers is not supported, as the confidence interval includes zero. This indicates that the effect of subjective knowledge on perceived barriers is insufficient to generate a meaningful indirect influence on consumption behavior.

Table 9 summarizes the total effects of cues to action, subjective knowledge, and objective knowledge on green food consumption behavior. The results show that all three predictors exert significant overall influences when both direct and indirect paths are taken into account. Cues to action demonstrate a total effect size of 0.237, with a confidence interval that does not include zero. This finding confirms that external prompts, reminders, and informational signals play an important role in encouraging consumers to choose green food products.

Subjective knowledge shows a total effect of 0.293, and its confidence interval also excludes zero. This indicates that consumers' perceived familiarity and self assessed understanding of green food consistently contribute to behavioral engagement. Although the direct path of subjective knowledge to consumption behavior was not statistically significant in earlier analyses, the significant total effect reflects the importance of its indirect influence through health belief constructs.

Objective knowledge likewise shows a significant total effect of 0.273. This suggests that factual understanding of green food certification, safety standards, and production processes ultimately promotes consumption behavior, even though the direct pathway was previously found to be non significant. The significant total effect once again underscores the mediating role of perceived benefits, perceived barriers, perceived susceptibility, and perceived severity.

Taken together, the total effect results reveal that both forms of knowledge contribute meaningfully to green food consumption and that cues to action provide an additional source of behavioral motivation. These findings confirm the integrated nature of the model and highlight that indirect cognitive pathway serve as the primary mechanism linking knowledge to consumer behavior.

Table 10 presents the direct effects of the demographic control variables on green food consumption behavior. The results show that average monthly income and education level have significant positive impacts on GCB, whereas age and marital status remain statistically not significant. Higher income is associated with more frequent green food purchasing ($\beta = 0.11$, $p = 0.003$), which is consistent with the idea that consumers with greater economic resources are better able to afford price premiums and to prioritize health oriented products within their household budgets. Education level also exerts a positive and significant effect on GCB ($\beta = 0.17$, $p = 0.001$), suggesting that better educated consumers are more capable of understanding certification information, evaluating food safety risks, and translating health awareness into concrete purchasing decisions.

By contrast, age has a negative but statistically insignificant effect on GCB ($\beta = -0.111$, $p = 0.063$). This result suggests that within the group of Beijing women aged 20 to 60, generational differences in green food purchasing are weak once income, education, and health related beliefs are taken into account. In large Chinese cities such as Beijing, women across this age range share similar exposure to food safety incidents and health information and commonly take primary responsibility for household food purchases, so age per se does not create a clear divide in green food consumption.Marital status also shows no meaningful association with GCB ($\beta = -0.022$, $p = 0.728$). After controlling for household income, education, parenting status, and psychological variables, being single, married, divorced, or widowed does not substantially change the

likelihood of buying certified green food. This pattern reflects the growing economic independence of urban Chinese women and the fact that food related decisions are increasingly made by women regardless of their marital status, which reduces the explanatory power of marital status as a simple demographic marker in this context.

Overall, the findings suggest that socioeconomic position, captured by income and education, still matters for green food consumption, while purely demographic markers such as age and marital status have limited explanatory power in this context.

Discussion

The study set out to understand the path of knowledge translating into certified green food consumption among Chinese women in Beijing. The findings show a consistent pattern: neither subjective knowledge nor objective knowledge has a significant direct effect on green food consumption behavior, but both types of knowledge strongly shape women's health beliefs, including perceived benefits, perceived barriers, perceived susceptibility and perceived severity. These health belief constructs, together with cues to action, emerge as the most proximal determinants of consumption behavior, and they mediate most of the relationships between knowledge and behavior. Besides, we also reveal that income and education level exert additional positive effects on green food consumption, whereas age and marital status do not show significant independent influences once knowledge and psychological variables are taken into account.

Earlier research on sustainable food often treated knowledge as a single undifferentiated construct and assumed that more knowledge would directly translate into greener purchasing decisions[63,64]. By distinguishing subjective knowledge from objective knowledge and examining their joint position at the cognitive starting point of health beliefs and cues to action, the present study shows how knowledge is channelled into certified green food consumption among Chinese women in Beijing without exerting a direct behavioural effect.

The findings also reposition the role of the HBM in food choice research. Prior applications in food related settings mainly focused on risk perceptions and perceived benefits at the level of individual beliefs[65,66]. Our results indicate that subjective and objective knowledge, together with income and education, shape these belief structures and cues to action, which then function as the most immediate antecedents of certified green food purchasing, while age and marital status lose their influence once psychological variables are considered. Taken together, these results shift the discussion from asking whether knowledge matters to explaining through which belief pathways knowledge and socioeconomic position are converted into concrete green food behaviours in the Chinese food safety context.

Theoretical implications

This study significantly expands the theoretical application of the Health Belief Model in the field of sustainable food consumption among Chinese women. In this way the model becomes a cognitive bridge that converts knowledge into protective food choices and its role in integrated frameworks combining knowledge and behavior is substantially extended.

On the other hand, this research contributes to the KAB by demonstrating that attitudes toward green food are not unidimensional but instead arise from a constellation of health-related beliefs. Traditional versions of the KAB model assume that knowledge generates a general evaluative attitude which then informs behavior [67]. However, more contemporary work recognizes that attitudes related to sustainable food choices reflect multiple evaluative components linked to risk management, personal health considerations, environmental responsibility, and social norms[68,69]. Health beliefs function as a set of interrelated attitudinal components, this study provides a multidimensional understanding of how attitudes develop in the context of green food consumption. This strengthens the theoretical explanatory power of the knowledge-attitude-behavior structure and supports a more complex conception of psychological evaluation processes in sustainability-oriented consumption.

Finally, the study enriches the gendered perspective within sustainable consumption theory by focusing specifically on Chinese women, who

often play central roles in household health management and food purchasing. Women exhibit stronger concerns about health and food safety and are more inclined to engage in protective food-related behaviors[42,70]. This study shows that women's green food consumption is strongly shaped by perceptions of health risks and benefits, thereby providing empirical support for a health-oriented and risk-management perspective that complements existing environmental motivation theories.

The findings therefore extend existing gender-sensitive frameworks and highlight how socialized caregiving roles and health responsibilities shape sustainable consumption decisions among women.Beyond health beliefs, the results also reveal that education and income retain additional explanatory power for women's green food purchasing. Higher educational attainment appears to strengthen health literacy, label comprehension and risk evaluation skills, which makes it easier for women to translate abstract information about pesticide residues or certification standards into stable beliefs and protective food related behaviours[71]. In turn, higher household income relaxes budget constraints and allows women to act on these beliefs by paying price premiums for certified products and prioritising food safety within household expenditure, a pattern that echoes prior evidence that organic and green food markets are disproportionately sustained by better off consumers[72].

Theoretically, these findings enrich the Health Belief Model by demonstrating that structural resources such as education and income shape not only background characteristics but also the very formation and enactment of health beliefs in the domain of food safety [73,74]. Instead of treating socioeconomic status as a mere control factor, the model derived from this study locates it upstream of cognitive and motivational processes, showing how structural advantages increase the likelihood that perceived benefits, perceived severity and cues to action are converted into sustained green food purchasing. At the same time, the results extend the Knowledge–Attitude–Behaviour framework by revealing that knowledge does not operate in a social vacuum. The behavioural returns to both subjective and objective knowledge are larger among highly educated and high income women, suggesting that KAB pathways are conditioned by unequal access to the financial and cognitive resources required to implement protective food choices. In this way, the study links gendered caregiving roles with socioeconomic position and offers a more structurally grounded account of women's protective food related behaviours in contemporary urban China.

Study strengths and limitations

First, this study advances theory by integrating the Knowledge–Attitude–Behavior (KAB) model with the Health Belief Model (HBM) and empirically demonstrating a "knowledge → health beliefs/cues → behavior" pathway in a certification- and risk-sensitive food context. Second, it refines the knowledge construct by separating objective knowledge from subjective knowledge, which improves conceptual clarity and avoids the common oversimplification that "more knowledge automatically produces greener behavior." Third, the model explicitly tests multiple belief mechanisms (perceived benefits, barriers, susceptibility, and severity) together with cues to action, allowing a more complete explanation of how knowledge becomes actionable in certified green food purchasing. Finally, by incorporating socioeconomic variables alongside psychological mechanisms, the study provides a more realistic account of certified green food consumption that considers both cognitive processes and structural resources.

Several limitations should be acknowledged. First, the study relies on cross-sectional survey data, which restricts causal inference; the observed pathways are consistent with the proposed framework, but longitudinal or experimental designs are needed to confirm temporal ordering and causality. Second, key constructs are self-reported, which may introduce common method bias and social desirability effects, particularly for health- and sustainability-related behaviors; future studies could combine surveys with objective indicators (e.g., purchase records, receipt verification, or shopping tasks) to validate behavioral outcomes. Third, the sample focuses on Chinese women in Beijing, which strengthens

contextual relevance but limits generalizability to other regions, rural settings, or male consumers; replication across diverse Chinese cities and demographic groups would improve external validity and enable meaningful subgroup comparisons. Fourth, the operationalization of objective knowledge (typically based on limited factual items) may not fully capture the breadth of certification literacy and label comprehension in real markets; more comprehensive knowledge assessments and scenario-based tests could strengthen measurement precision. Finally, while the model highlights health beliefs and cues to action as proximal determinants, other influential factors in certified food choice—such as trust in certification bodies, perceived authenticity, availability constraints, and broader environmental or social-norm motivations—were not modeled and could be incorporated to further extend explanatory power.

Practical implications

For governmental departments, they should be responsible for food safety, health promotion, and sustainable consumption, furthermore, policy communication should emphasize the scientifically verified advantages of certified green food and clearly illustrate the potential health risks associated with uncertified products. Public authorities can therefore enhance practice by improving certification transparency, strengthening the visibility of official green food labels, and disseminating health risk information through government websites, community health programs, and widely used digital platforms. By doing so, they can reduce confusion about certification systems and assist consumers in forming accurate health-related evaluations.

For green food producers, retailers, and marketing practitioners, retailers may also strengthen point-of-purchase guidance through in-store educational materials, dedicated green food sections, and staff training programs that equip employees to respond to consumer questions about certification. Reducing perceived barriers is equally important. Businesses can achieve this by increasing the availability of certified products, diversifying price ranges, improving packaging clarity, and offering promotions or sampling opportunities that lower the financial and psychological thresholds to trial consumption.

Health professionals, nutrition educators, and community-based organizations also have important roles. Physicians, nutritionists, and community health workers can therefore incorporate green food knowledge into routine health counseling, emphasizing its relevance for chronic disease prevention, child health, and family well-being. Community organizations may design educational workshops, household nutrition programs, and neighborhood information sessions that reinforce protective dietary practices and provide reliable interpretations of certification labels and food safety regulations.

Digital platforms and social media ecosystems represent another critical arena of practical influence. Since many consumers acquire green food information through short video platforms, social networks, and search engines, the integration of accurate and credible content into these digital environments can substantially shape subjective knowledge formation[75,76]. Digital platforms can collaborate with authoritative science communicators and food safety experts to develop evidence-based content, including interactive micro-lessons, educational videos, and certification guides[77]. Influencers who engage in lifestyle, parenting, or health content can further support informed consumption by presenting scientifically grounded explanations rather than promotional messages based solely on commercial interests.

For individual consumers and households, the findings highlight the value of developing health-protective food routines based on reliable information sources. Since knowledge influences behavior mainly through health beliefs, families may benefit from jointly learning to interpret certification labels, comparing product attributes across shopping environments, and adopting household norms that prioritize verified safety and nutritional value. Providing consumers with accessible tools, such as mobile applications or printed checklists that explain green food standards, can strengthen their capacity for informed decision-making.

Conclusion

This study investigated how subjective knowledge and objective knowledge jointly shape Chinese women's green food consumption behavior through multiple health belief pathways. The analysis demonstrated that neither subjective knowledge nor objective knowledge has a significant direct effect on certified green food purchasing. Instead, both forms of knowledge exert their influence mainly through health belief constructs. Higher levels of subjective knowledge and objective knowledge strengthen perceived benefits, perceived susceptibility and perceived severity, and reduce perceived barriers. Through these changes in health related beliefs, subjective knowledge and objective knowledge both promote green food consumption, with objective knowledge additionally exerting an indirect effect through lower perceived barriers. Cues to action all operate as significant facilitators of green food consumption, while perceived barriers hinder behavioral adoption. Demographic analysis further shows that average monthly income and education level have positive effects on green food consumption, whereas age and marital status do not display significant direct influences once knowledge and belief variables are taken into account. Taken together, the results portray a coherent empirical picture in which subjective knowledge, objective knowledge and health related beliefs jointly determine whether Chinese women translate their concerns about food safety and family health into stable certified green food purchasing.

Contributions

Q.Q--Writing, revison and data analysis; J.D--framework, project investigation and revison; S.J--Revision, data analysi and proofreading.

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