

The Impact of Food Nutrition Labels on Consumer Behavior: A Cross-national Survey and Quantitative Analysis

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ABSTRACT

This study explores the impact of food nutrition labels on consumer behavior through a cross-national survey and quantitative analysis. Globally, food nutrition labels have become an essential reference for consumers when choosing food products, and their significance is increasingly evident. Firstly, we found that the accuracy of food nutrition labels significantly influences consumer behavior. Accurate label information helps consumers make informed purchasing decisions, choosing healthier and more nutritious foods. However, inaccurate or misleading label information can lead to consumer misunderstanding, potentially triggering unhealthy eating habits or excessive intake of certain nutrients. Secondly, the readability and comprehensibility of food nutrition labels are also crucial factors affecting consumer behavior. Labels that are easy to read and understand provide more authentic and accurate product nutrition information, helping consumers quickly grasp the main ingredients and nutritional value of foods. Therefore, when designing food labels, manufacturers should focus on improving information readability and comprehensibility to facilitate consumer access to the required information. Furthermore, our research indicates that health claims and nutrition facts tables on food nutrition labels positively guide consumers' health awareness. An increasing number of consumers are beginning to pay attention to the nutritional content and health value of foods, preferring those labeled with health claims or nutrition facts tables. These labels not only provide scientific dietary advice to consumers but also help them control calorie intake and maintain healthy eating habits. In the cross-national survey, we also observed variations in consumer attention to food nutrition labels across different countries and regions. In developed countries, consumers tend to place a higher emphasis on food labels, whereas in developing countries, due to a lack of nutritional knowledge, consumer attention to food labels is relatively low. Therefore, manufacturers and governments should tailor strategies to increase consumer awareness and utilization of food nutrition labels based on the characteristics of consumers in different regions. Finally, quantitative analysis further confirms the impact of food nutrition labels on consumer purchasing decisions. Information on labels, such as calorie content, fat, fiber, sugar, etc., can help consumers make more scientific and reasonable choices for their food products. Meanwhile, health slogans and related certification marks on labels can increase consumer recognition of the product's health value, thereby enhancing their willingness to purchase. In summary, food nutrition labels have a profound impact on consumer behavior. To ensure that consumers can make informed purchasing decisions, manufacturers and governments should strive to improve the accuracy, readability, and comprehensibility of food nutrition labels, and strengthen the popularization and education of related knowledge.

KEYWORDS

Food nutrition labels; Consumer behavior; Cross-national survey; Quantitative analysis

1. INTRODUCTION

2.1. Research Background and Significance

Amidst the global enhancement of health awareness, food nutrition labels serve as crucial tools for conveying nutritional information and health claims, profoundly influencing consumers' purchasing decisions. However, further exploration is needed to understand how nutrition labels specifically affect consumer behavior and the variations of this impact across different countries and regions. Additionally, with the globalization of the market economy and the internationalization of commodity circulation, differences in food nutrition labeling regulations and standards among countries may also influence consumer purchasing behavior. Therefore, this study aims to comprehensively reveal the mechanism of the impact of food nutrition labels on consumer behavior through a cross-national survey and quantitative analysis. This not only holds significant theoretical value, enriching and improving consumer behavior theory to provide theoretical support for nutrition label design and related policy formulation, but also has far-reaching practical implications. It can offer more effective dietary guidance to consumers, provide a basis for government policy-making, help food companies more accurately grasp market demand, enhance product competitiveness, and promote the healthy development of the entire food industry[1].

2.2. 1.2 Research Methods and Data Sources

This study employs a mixed methodology, combining qualitative and quantitative research approaches to delve into the impact of food nutrition labels on consumer behavior. Initially, through extensive literature review, we sort out existing theories and research on food nutrition labels and consumer behavior, laying a theoretical foundation for subsequent empirical research. Subsequently, a detailed questionnaire survey is designed, targeting consumers from different countries to collect large-scale data. The content includes basic consumer information, shopping habits, attention to food nutrition labels, understanding and usage, etc. To gain deeper insights into consumer perspectives, we also select a representative group of consumers for in-depth interviews. Meanwhile, statistical software such as SPSS and AMOS is utilized to analyze the collected data, revealing the intrinsic connection between food nutrition labels and consumer behavior. Data sources encompass publicly available data, survey data, interview records, and retail and sales data obtained through collaboration with retailers. This information not only provides a macro background and industry trends but also directly reflects consumers' cognition and usage of food nutrition labels, as well as the impact of labels on sales volume. By integrating these methods and data sources, this study aims to comprehensively and deeply explore the influence of food nutrition labels on consumer behavior, aiming to provide a scientific basis for policy formulation and marketing.

2. OVERVIEW OF FOOD NUTRITION LABELS

2.1. Definition and Function of Food Nutrition Labels

Food nutrition labels are explanations of the nutritional characteristics on food labels, including nutritional fact tables and additional nutritional fact tables. They are the simplest and most direct way for consumers to understand food nutrition information and acquire nutritional knowledge. Specifically, food nutrition labels must indicate the content of nutrients and their percentage of the Nutrient Reference Values (NRV), commonly known as the "1+4" rule. This means that the nutritional information on the label must include the content and NRV percentage of energy and four core nutrients (protein, fat, carbohydrates, and sodium). The primary functions of food nutrition labels are to guide and standardize the labeling of food nutrition, ensuring that the nutritional information on food labels is authentic, objective, and credible, in compliance with the national standard "General Principles for Nutrition Labeling of Prepackaged Foods." (as Figure 1) Additionally, they aim to guide

consumers in making informed choices about prepackaged foods by clearly and accurately displaying the nutritional composition and information of foods, helping consumers understand the nutritional characteristics of foods and make wiser purchasing decisions. Furthermore, they promote public dietary nutrition balance and physical health. The popularization and use of nutrition labels help raise awareness of nutritional knowledge, guiding people to form healthy eating habits, thereby promoting dietary nutrition balance and physical health. The utmost importance lies in protecting consumers' right to know and choose. Nutrition labels provide consumers with essential food nutrition information, enabling them to have a more comprehensive understanding of food ingredients and characteristics, thereby protecting their right to know and choose. Food nutrition labels play a crucial role in assisting consumers in purchasing foods, understanding food nutrition information, and protecting their rights and interests [1, 2].

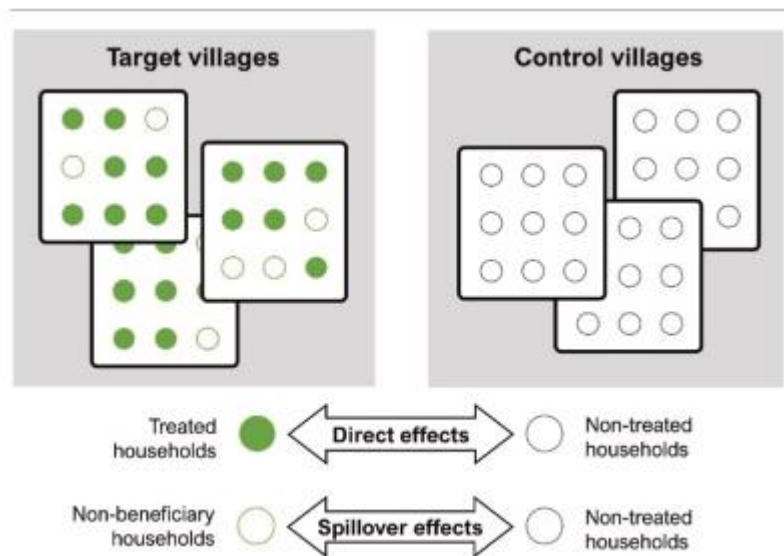


Figure 1. General Principles for Nutrition Labeling of Prepackaged Foods

2.2. International Standards and Differences in Food Nutrition Labels

The international standards and differences in food nutrition labels primarily manifest in varying content, formats, and labeling requirements across different countries and regions. The Food and Drug Administration (FDA) in the United States requires specific labeling standards, mandating the inclusion of total fat, saturated fat, cholesterol, sodium, total carbohydrates, dietary fiber, sugar, protein content, as well as vitamins and minerals on the label. The European Union (EU) has established standards that require food packaging to include nutrition labels. Labels must list the food's energy value, fat, saturated fat, sugar, salt, and protein content. China's Food Safety Law requires that food packaging must indicate the nutritional fact table. The label should include the food's total energy, protein, fat, saturated fat, trans fat, carbohydrates, sugar, sodium, and cholesterol content. Moreover, different countries and regions may formulate different nutrition labeling requirements based on factors such as economic strength, implementation difficulty, reading ability of the population, and corporate execution capabilities. For instance, some countries may demand the indication of more nutrients, while others may only require the indication of basic nutrients. Overall, although there are differences in the specific requirements of food nutrition labels among countries, the common goal is to provide accurate, comprehensive, and easy-to-understand nutritional information so that consumers can make informed food choices. At the same time, these standards contribute to the healthy development of the food industry, improving food quality and safety.

2.3. Development Trends of Food Nutrition Labels

Firstly, the trend is toward comprehensiveness and transparency of information. Future food nutrition labels will not be limited to basic ingredients and nutrients but will also include more detailed information such as food processing techniques and place of origin. This will help consumers have a more comprehensive understanding of the safety and authenticity of foods.

To enhance the reading experience and convenience for consumers, food nutrition labels will increasingly adopt visual forms such as charts and images to display the nutritional content of foods. This intuitive approach will enable consumers to quickly understand the nutritional value of foods. Secondly, the establishment of a traceability system is essential. As consumers' demands for food safety and quality increase, future food nutrition labels will be connected to a food traceability system. Consumers can inquire about the production process, supply chain, and other information of foods by scanning the QR code on the label, thereby enhancing trust in foods. Moreover, the application of intelligent technology in food nutrition label supervision will become increasingly common. For example, by utilizing QR code or barcode technology, consumers can easily obtain detailed nutritional information and ingredient lists, improving the readability and comprehensibility of labels. Most importantly, the authenticity of information will be strengthened. Given the frequent occurrence of food safety issues in recent years, regulatory authorities will further strengthen the supervision of label content authenticity, increasing efforts to crack down on false advertising and misleading consumer behavior to protect consumers' rights and interests. The development trend of food nutrition labels will focus more on the comprehensiveness, transparency, and visualization of information. Simultaneously, intelligent technology will be utilized to improve the readability and authenticity of labels to meet consumers' demands for food safety and nutritional information [3].

3. THEORETICAL BASIS OF CONSUMER BEHAVIOR

3.1. Consumer Decision-making Process

The consumer decision-making process is a complex one involving multiple stages and factors. This process begins when a consumer recognizes a problem or need, gathers relevant information to evaluate different options, and ultimately makes a purchase decision. Problem recognition: Consumers first identify and understand their needs or problems, which may be based on internal motivations (such as hunger or thirst) or external stimuli (such as advertising or recommendations from others). Once a problem is identified, consumers begin to gather information from various sources, including personal experience, advice from friends and family, product reviews, advertising, and social media. This information helps consumers understand the characteristics, prices, performance, and other aspects of different brands and products. After collecting enough information, consumers evaluate different options, comparing the advantages and disadvantages of various brands or products, and considering factors such as price, quality, performance, and reputation. Finally, consumers choose one or more brands or products based on their needs and preferences. After determining the brand or product to purchase, consumers further consider where to buy it. This may involve comparing prices, services, convenience, and other factors across different stores. Once a decision is made, consumers proceed with the purchase. After the purchase, consumers use and evaluate the product. If the product meets expectations, consumers may feel satisfied and recommend it to others; if it does not, they may feel disappointed and consider switching brands or products. Post-purchase evaluation also affects consumers' future purchase decisions. Purchase involvement is an important influencing factor in the consumer decision-making process. It refers to the degree of interest or concern that consumers have in the decision-making process due to a specific purchase need. Different levels of purchase involvement can lead to different decision types, such as nominal decision-making (low involvement, simple purchase), limited decision-making (medium involvement,

requiring some comparison and selection), and extended decision-making (high involvement, requiring in-depth research and consideration).

In addition, the consumer decision-making process is influenced by various factors, including personal experience, family influence, reference groups, and cultural factors. These factors play an important role in the process of consumers gathering information, evaluating options, and making final decisions. Understanding the consumer decision-making process helps companies better understand consumer needs and behaviors, enabling them to develop more effective marketing and product strategies. By providing products and services that meet consumer needs and expectations, companies can improve consumer satisfaction and loyalty, thereby enhancing their market share and competitiveness.

3.2. Consumer Perception and Attitude

Consumer perception refers to the process by which consumers process, analyze, and interpret external information about a product in the market, ultimately forming a specific understanding of the product. This process involves a series of information gathering, interpretation, and integration, including perception, sensation, imagination, memory, and thinking. Consumers' ability to process and interpret information is key to the cognitive process, with information sources potentially including personal experience, recommendations from friends and family, sales techniques used by marketing personnel, product packaging text descriptions, and mass media such as television advertisements. Consumer attitude, on the other hand, represents an individual's relatively stable psychological reaction tendency towards a particular object, encompassing cognitive evaluation, emotional response, and behavioral tendency. Specifically, attitude consists of three main components: cognitive, affective, and behavioral. The cognitive component is composed of consumers' beliefs about a particular object, representing their evaluation of the attitude object and forming the foundation of their attitude. The affective component reflects consumers' feelings or emotional reactions towards an object, which is closely related to their behavior. The behavioral component is the external manifestation of consumers' attitudes, representing their reaction tendency towards relevant goods and services. In the shopping decision-making process, consumers' perception and attitude interact and influence each other. Consumers' perception of a product affects their attitude towards it, which in turn influences their purchase decisions and behaviors. Therefore, businesses and merchants need to deeply understand consumers' perception and attitude during the market promotion and product sales process to better meet consumer needs, enhance brand image, and promote product sales. Additionally, various factors influence consumers' perception and attitude, including age, gender, culture, occupation, personal economic factors, and more. These factors can lead different consumers to have different perceptions and attitudes towards the same product (as figure1 and figure2). When formulating market strategies, enterprises should fully consider these differences to more effectively target different consumer groups for market promotion. Consumer perception and attitude are integral parts of consumer behavior research, playing a significant role in understanding consumer behavior, predicting market trends, and formulating effective market strategies [1, 4].

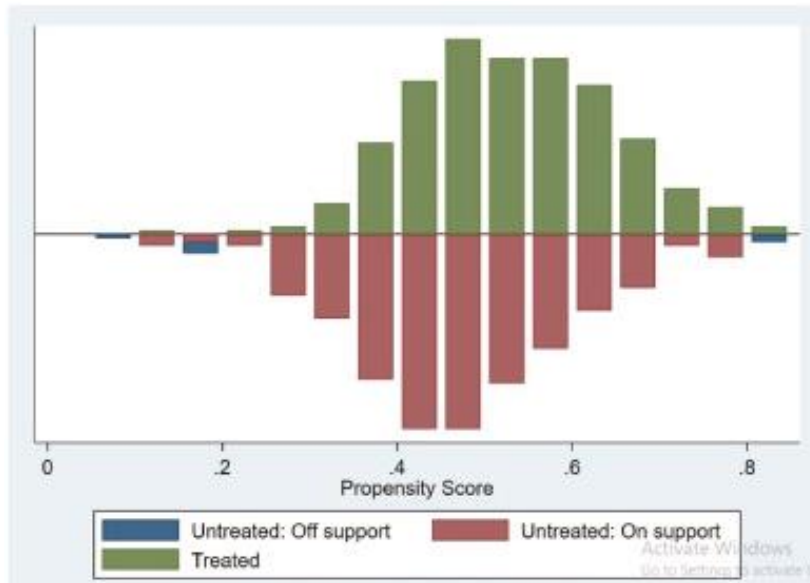


Figure 2. Propensity score distribution and common support area for direct impact assessment

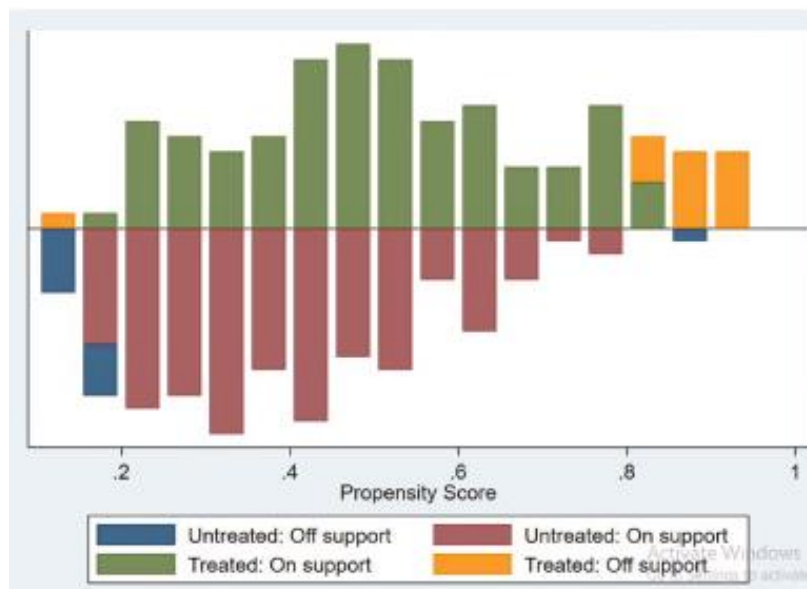


Figure 3. Propensity score distribution and common support area for spillover effect assessment.

4. CROSS-NATIONAL SURVEY DESIGN AND IMPLEMENTATION

4.1. Survey Respondents and Sample Selection

Selecting survey respondents and samples is crucial when conducting a cross-national survey on the impact of food nutrition labels on consumer behavior.

The survey respondents primarily include consumers across multiple countries, particularly those who pay attention to food nutrition labels and make purchase decisions based on them. Due to cultural backgrounds, consumption habits, and economic conditions varying among different countries, the survey respondents should possess a certain level of representativeness to reflect consumer behavior characteristics in various countries and regions. The samples should come from diverse countries and regions to ensure the cross-national and universal nature of the survey results. When selecting samples, factors such as the economic development level, cultural background, and consumption habits of each

country should be fully considered. The sample size should be sufficiently large to ensure the accuracy and reliability of the survey results. Meanwhile, the sample size should be adjusted according to the actual situations in different countries and regions. The samples should possess a certain level of representativeness, reflecting the demand and behavior characteristics of consumers across different age groups, genders, occupations, and income levels. Additionally, consumers with specific consumption habits or those who pay attention to food nutrition labels can be selected as samples based on the research objectives. During the sampling process, methods such as random sampling and stratified sampling can be employed to ensure the representativeness and randomness of the samples. Meanwhile, appropriate sampling methods should be selected based on the actual situations in different countries and regions. When conducting cross-national surveys, the linguistic and cultural differences among different countries should be fully considered. It may be necessary to design multi-language versions of the survey questionnaire and adapt it to the local cultural background and consumption habits. Legal policies regarding food nutrition labels may vary among countries (as Table 1). Therefore, it is essential to fully understand and comply with local laws and regulations during the survey process. To ensure the accuracy and reliability of the survey results, strict data quality control measures should be implemented, including questionnaire design, data collection, data processing, and analysis. Selecting appropriate survey respondents and samples is crucial for conducting a cross-national survey on the impact of food nutrition labels on consumer behavior (as Table 1). Through scientific sampling methods and strict data quality control, the accuracy and reliability of the survey results can be ensured, providing strong support for relevant policy formulation and business decision-making.

Table 1. Key Elements and Considerations

Key Elements and Considerations	Description
Survey Respondents	Consumers across multiple countries, particularly those attentive to food nutrition labels
Sample Diversity	Respondents from diverse countries, economic backgrounds, cultures, and consumption habits
Sample Size	Sufficiently large to ensure accurate and reliable survey results
Sampling Methods	Random sampling, stratified sampling
Linguistic and Cultural Considerations	Design multi-language versions of the survey, adapt to local culture and habits
Legal Policies	Compliance with local laws and regulations regarding food nutrition labels
Data Quality Control	Measures include questionnaire design, data collection, processing, and analysis

4.2. Survey Tools and Questionnaire Design

Conducting a cross-national survey on the impact of food nutrition labels on consumer behavior requires the use of effective survey tools and carefully designed questionnaires to ensure data accuracy and reliability. The first step is to determine the survey method. Online survey platforms can facilitate cross-national surveys and collect large amounts of data. These platforms often support multiple languages, adapting to the linguistic environments of different countries. Social media and online forums are important channels for obtaining consumer opinions and feedback. Monitoring and analyzing discussions on these platforms can provide insights into consumers' attitudes and behaviors regarding food nutrition labels. Collaborating with professional market research institutions can offer more comprehensive and in-depth cross-national survey services, including sample selection, data collection, and analysis. When designing the questionnaire, the survey's purpose and research

questions should be clarified first to ensure that the questionnaire content specifically collects the required information. In cross-national surveys, cultural backgrounds and consumption habits can lead to variations in consumers' understanding and use of food nutrition labels. Therefore, the questionnaire design should consider these differences and avoid using terminology and expressions that may cause misunderstanding or ambiguity. The questionnaire should include various types of questions, such as multiple-choice and open-ended questions, to gather rich data. The order of the questions should follow a logical sequence, progressing from simple to complex and general to specific. For cross-national surveys, the questionnaire needs to be translated into multiple languages. During the translation process, semantic accuracy and fluent expression should be ensured, and professionals should proofread the translations to avoid misunderstandings due to language issues. In the questionnaire design, participants should be clearly informed about the purpose and use of data collection, and appropriate measures should be taken to protect their privacy and data security. Before the formal survey, a pre-test should be conducted to assess the questionnaire's validity and reliability. Based on the pre-test results, necessary revisions and improvements can be made to the questionnaire. Appropriate data analysis tools should be selected to process and analyze the collected data, extracting useful information and conclusions.

Conducting a cross-national survey on the impact of food nutrition labels on consumer behavior requires a combination of various survey tools and a carefully designed questionnaire (as Table 2). Through scientific methods and a rigorous approach, accurate and reliable data can be obtained, providing strong support for policy formulation and business decision-making [5].

Table 2. Consumer behavior influence

Key Steps and Elements	Description
Survey Method	Online surveys, social media monitoring, market research institutions
Questionnaire Design	Consider cultural differences, use of multiple languages, various question types
Translation Process	Ensure semantic accuracy, fluent expression, proofreading
Pre-test	Assess validity and reliability, make revisions
Data Analysis	Select appropriate tools, extract useful information

5. CASE ANALYSIS

5.1. Comparison of Consumer Behaviors in Different Countries

The impact of food nutrition labels on consumer behavior varies among countries, influenced by factors such as culture, economy, laws and regulations, and consumer habits. The following compares consumer behaviors in different countries: Cultural backgrounds and consumer habits in different countries can affect consumers' attention to and interpretation of food nutrition labels. For example, in countries that value healthy eating, consumers may pay more attention to nutrients like calories, fat, and sugar on food labels. In contrast, in countries with deep-rooted traditional dietary cultures, consumers may focus more on information such as the origin and processing methods of food. Economic development and purchasing power also influence consumers' attention to food nutrition labels. In more economically developed countries, consumers may be more willing to pay higher prices for healthy, high-quality food and tend to choose foods that meet their health needs based on nutrition labels. In contrast, consumers in economically disadvantaged countries may focus more on food prices and basic nutritional needs, with less attention paid to nutrition labels. Laws, regulations, and standards for food nutrition labels differ among countries. Some countries have strict nutrition labeling regulations, requiring food manufacturers to provide detailed nutritional information and specifying the format and content of the labels. This helps consumers clearly understand the

nutritional content of foods, enabling them to make wiser purchasing decisions. In countries with looser regulations, the accuracy and completeness of food nutrition labels may be questionable, affecting consumers' trust and frequency of use.

Consumers' education level and health awareness are also important factors influencing their attention to food nutrition labels. In countries with higher education levels and stronger health awareness, consumers may be more capable of interpreting nutrition labels and more focused on the nutritional value and health impacts of food. In contrast, consumers in countries with lower education levels or weaker health awareness may pay less attention to nutrition labels, focusing more on aspects such as taste and texture. In summary, the impact of food nutrition labels on consumer behavior varies among countries. To better meet consumer needs and enhance the competitiveness of the food industry, countries should formulate appropriate food nutrition labeling regulations and standards based on their specific situations and strengthen consumer health education and awareness-raising efforts. Meanwhile, food manufacturers should actively respond to market demands, providing accurate, clear, and easy-to-understand food nutrition labels to help consumers make wiser purchasing decisions.

5.2. The Impact of Nutrition Labels on Consumer Purchasing Decisions

For consumers who focus on healthy eating, the fat content on nutrition labels is an important consideration. For example, a consumer on a diet will carefully check the fat content on nutrition labels when buying snacks and tend to choose low-fat or fat-free products. Nutrition labels provide clear information on fat content, helping them make healthier purchasing decisions. For diabetics, controlling sugar intake is crucial. The sugar content information on nutrition labels can help them identify which foods are suitable for consumption. For example, when choosing beverages, diabetics will check nutrition labels and select low-sugar or sugar-free drinks to control their blood sugar levels. Athletes often need to consume more protein to support muscle growth and recovery. The protein content information on nutrition labels can help them quickly find high-protein foods. For example, when purchasing meat or protein powder, athletes will check nutrition labels and choose products with higher protein content. For vegetarians, avoiding animal ingredients is essential. The ingredient list on nutrition labels can help them identify whether food contains animal ingredients such as meat, dairy, or eggs. This allows them to make decisions that align with their dietary principles when purchasing food. When selecting food for their children, parents pay special attention to the sugar, salt, and additive content on nutrition labels. They tend to choose foods with lower sugar and salt content and fewer additives to ensure their children's healthy diet. These examples demonstrate that nutrition labels provide consumers with detailed information about the nutritional content of food, helping them make wiser purchasing decisions based on their needs and preferences. Whether it's focusing on health, specific dietary requirements, or personal preferences, nutrition labels have become an indispensable reference for consumers when purchasing food.

6. CONCLUSION AND SUGGESTION

There are significant differences in the impact of food nutrition labels on consumer behavior across different countries. These differences primarily stem from various factors such as cultural backgrounds, economic development levels, consumer health awareness, regulatory policies, and the competitiveness of the food market. In some developed countries, consumers tend to pay more attention to food nutrition labels. They prefer to use nutrition labels to understand the nutritional content of food and make healthier purchasing decisions. Consumers in these countries generally have a higher level of education, stronger health awareness, and higher requirements for food quality and safety. In addition, the regulatory policies in these countries are relatively well-established, with clear provisions on the content and format of food nutrition labels, thereby ensuring the accuracy and reliability of label information. However, in some developing countries, consumers pay relatively less attention to food nutrition labels. This may be due to their limited education level and weak

ability to interpret nutrition labels, or their economic conditions that make them focus more on food prices rather than nutritional value. Furthermore, the regulatory policies in these countries may be relatively lagging, and the supervision of food nutrition labels is not strict enough, leading to questions about the accuracy and reliability of label information. Countries should strengthen health education to enhance consumers' understanding of the nutritional value of food. Through publicity and educational activities, consumers should be guided to pay attention to food nutrition labels and learn to correctly interpret and use this information. Countries should formulate and improve regulations and policies on food nutrition labels, clarify the content and format requirements of labels, and ensure the accuracy and reliability of label information. Simultaneously, supervision should be strengthened, and enterprises that violate regulations should be punished to maintain market order and consumer rights. Food companies are encouraged to strengthen research and development and innovation to produce more nutritional foods that meet consumers' health needs. At the same time, enterprises should focus on consumer demand and market changes, adjust product structure and marketing strategies in a timely manner, and enhance product competitiveness and market share. Countries should strengthen international cooperation and exchanges in the field of food nutrition labeling, share experiences and practices, and jointly promote the development and improvement of the global food nutrition labeling system. There are differences in the impact of food nutrition labels on consumer behavior across different countries. To fully leverage the role of nutrition labels in guiding consumers toward healthy eating, countries need to comprehensively consider their national conditions and consumer needs to formulate appropriate policies and measures.

REFERENCES

- [1] Sileshi M, Steinke J, Dietrich C, et al. Spillover effects of food and nutrition security interventions on non-treated population: Evidence from Madagascar [J]. *Journal of Agriculture and Food Research*, 2024, 15 101052-.
- [2] F. K, R. L, A. W, et al. Impact and process evaluation of a primary-school Food Education and Sustainability Training (FEAST) program in 10-12-year-old children in Australia: pragmatic cluster non-randomized controlled trial [J]. *BMC Public Health*, 2024, 24 (1): 657-657.
- [3] Pagaduan E J, Lazarescu C, Vallieres E, et al. The impacts of the Nutrition North Canada program on the accessibility and affordability of perishable, nutritious foods among eligible communities: a scoping review. [J]. *International journal of circumpolar health*, 2024, 83 (1): 2313255-2313255.
- [4] Xiaoyu L, Liangjie X, Xiubin L. The global nutrition can be greatly improved with diet optimization [J]. *Resources, Conservation & Recycling*, 2024, 202 107343-.
- [5] Katie K, Jennifer B, Deborah R. Ready-to-use-item database to improve nutrition labeling program efficiency [J]. *Journal of Food Composition and Analysis*, 2023, 124
- [6] Silva D P C, Bento C A, Guaraldo E. The impact of front-of-the-packaging nutrition labelling warnings on consumer habits: a scoping review exploring the case of the Chilean Food Law [J]. *British Food Journal*, 2022, 124 (13): 66-80.
- [7] Sruthi V, M. S M, Hanawa H P, et al. The impact of financial incentives and restrictions on cyclical food expenditures among low-income households receiving nutrition assistance: a randomized controlled trial [J]. *International Journal of Behavioral Nutrition and Physical Activity*, 2021, 18 (1): 157-157.
- [8] Noemi P, Ashwini S, Silvio D, et al. Mediation analysis of the impact of the Zimbabwe Harmonized Social Cash Transfer Programme on food security and nutrition [J]. *Food Policy*, 2022, 106
- [9] Michael S, Angela B, Christina H. The impacts of diet-related health consciousness, food disgust, nutrition knowledge, and the Big Five personality traits on perceived risks in the food domain [J]. *Food Quality and Preference*, 2022, 96
- [10] Fiorella P, F L G, Dominique R. The impact of COVID-19 on diet quality, food security and nutrition in low and middle income countries: A systematic review of the evidence. [J]. *Clinical nutrition (Edinburgh, Scotland)*, 2021, 41 (12): 2955-2964.
- [11] Anastasios B, John B, Jamie H, et al. The Impact of Environmental Sustainability Labels on Willingness-to-Pay for Foods: A Systematic Review and Meta-Analysis of Discrete Choice Experiments [J]. *Nutrients*, 2021, 13 (8): 2677-2677.
- [12] Charlotte H, I. J M, Pete S, et al. The impact of climate and societal change on food and nutrition security: A case study of Malawi [J]. *Food and Energy Security*, 2021, 10 (3):