Retraction

Retracted: Promotion Strategy of Low-Carbon Consumption of Fresh Food Based on Willingness Behavior

Mathematical Problems in Engineering

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/ participant consent to participate, and/or agreement to publish patient/ participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] Z. Zhao, X. Zhong, and Y. Zhu, "Promotion Strategy of Low-Carbon Consumption of Fresh Food Based on Willingness Behavior," *Mathematical Problems in Engineering*, vol. 2022, Article ID 9571424, 10 pages, 2022.

Research Article

Promotion Strategy of Low-Carbon Consumption of Fresh Food Based on Willingness Behavior

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The research on the influencing factors of residents' low-carbon consumption willingness and low-carbon consumption behavior of fresh food has certain practical guiding significance. Existing studies have analyzed the low-carbon consumption willingness, but the factors considered are not comprehensive and the degree of fit needs to be improved. Therefore, this paper starts with 37 variables from six aspects: demographic factors, psychological factors, low-carbon related knowledge, external factors, policy norms, and product factors. The binary logistic model is used to carry out regression analysis on low-carbon consumption willingness and low-carbon consumption behavior, and the fitting degree is higher and reaches about 90%. The regression results show that sense of responsibility, government tax, low-carbon product quality, and low-carbon product price have a significant impact on residents' low-carbon consumption willingness. Whether there are fake and shoddy products in the market and whether the products are really of low carbon have a significant impact on low-carbon consumption behavior. Finally, starting from the three subjects of government, enterprises, and residents, this paper puts forward targeted suggestions to improve residents' low-carbon consumption willingness and promote residents' low-carbon consumption behavior, in order to promote low-carbon consumption.

1. Introduction

Environmental problems have become a serious problem faced by the world in the 21st century; in particular the increase of carbon emissions year by year leads to the acceleration of global warming but also has an adverse impact on people's life and social and economic development. COVID-19 is the main reason for this problem, which is the large amount of carbon emissions produced by human beings in production and life. According to the statistics of world energy statistics yearbook, the global carbon emissions reached 343.6 billion tons in 2019. In 2020, the carbon emissions of various regions in the world were generally reduced, and the global carbon emissions dropped to 322.8 billion tons, down 6.3% from the same period last year. As shown in Figure 1, although the quantity has decreased compared with previous years, there is still much room to control its emission. Low-carbon

consumption, with carbon emission reduction in consumption as the main content, will become an important part of the "double carbon" goal. In the field of consumption, residents are the main body of consumption, and fresh products are the necessities of their daily life. Fresh products refer to the primary products sold without deep processing such as cooking and production, which are only kept fresh and simply sorted on the shelves, as well as the commodities of on-site processing categories such as bread and cooked food. Fresh products are mainly circulated through the cold chain, but the high cost of cold chain logistics and easy disconnection in transportation will lead to the increase of carbon emissions [1]. The overall demand is large. However, due to the characteristics of being perishable and difficult to preserve, as well as the diversified, personalized, and high-quality needs of consumers, the carbon emission increases in the whole consumption process. Therefore, exploring the influencing factors of
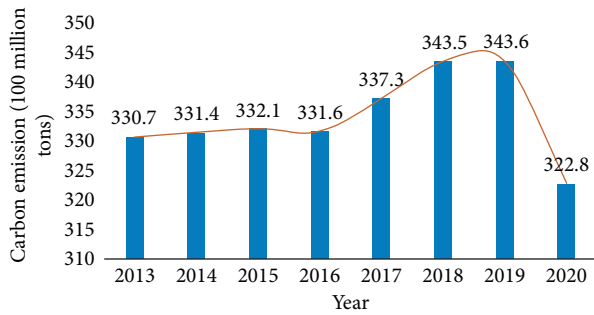
Figure 1: Change trend of global total carbon emissions from 2013 to 2020.

residents' willingness and behavior to consume fresh products is of great significance to reduce carbon emissions.

At present, urban residents are the main body of low-carbon consumption. The products produced by residents' consumption enterprises are also affected by relevant government policies. However, the consumption demand of urban residents for fresh products presents diversified and personalized characteristics. Therefore, to effectively control carbon emissions, it is necessary to effectively identify, influence, and guide residents' consumption patterns. The key is to fully grasp the influencing factors in the process of residents' low-carbon consumption. At present, the academic research results on low-carbon consumption are relatively rich. Looking at the existing literature, we can find that they are mainly concentrated in three aspects: "low-carbon consumption cognition," "low-carbon consumption factors," and "low-carbon consumption countermeasures."

1.1. Research on Low-Carbon Consumption Cognition. The low-carbon behavior and cognitive level of users' families can be measured from three aspects: family energy consumption, daily travel, and living consumption [2]. Low-carbon knowledge is divided into system knowledge, action knowledge, and effectiveness knowledge. By establishing a double intermediary model of the action mechanism of different low-carbon knowledge on low-carbon behavior, it can be found that publicity and education need to reduce the cognitive imbalance of residents' low-carbon behavior according to the action mechanism of different knowledge [3]. Socialist construction needs to build a smart city, and the key is to save energy and reduce emissions [4]. Most employees have a low level of low-carbon cognition, showing the law of gradual transition from low-carbon cognitive defects to one-sided, low-carbon negative employees and low-carbon advocates and employees [5]. Through the field investigation and tourist sampling questionnaire survey of Zhangjiajie National Forest Park, it is found that Zhangjiajie tourists have relatively high awareness and willingness of low-carbon tourism [6]. The carbon emission reduction action of tourism transportation and accommodation in Wutai Mountain is the most convenient to carry out, but tourists' low-carbon tourism cognition is still in the primary stage, so it is

difficult to implement low-carbon tourism [7]. The overall level of emission reduction behavior of urban residents in China is low, and environmental awareness and environmental responsibility can significantly improve the public's emission reduction behavior [8]. The increasingly diversified needs of consumers have intensified the competition of network service providers in providing products [9].

1.2. Research on Low-Carbon Consumption Factors. Publicity and education had the greatest impact on low-carbon consumption behavior, followed by the degree of implementation convenience, the impact of low-carbon behavior knowledge was weak, and the impact of low-carbon psychological awareness and social reference norms on low-carbon consumption behavior was not obvious [10]. Low-carbon cognition, energy-saving behavior, and waste disposal behavior have a significant positive impact on low-carbon consumption intention, while marginal carbon crisis awareness has a significant impact [11]. Demographic characteristics, personal cognition, environmental scenarios, and other factors have an impact on residents' low-carbon consumption willingness and behavior, and corresponding policy suggestions are put forward accordingly [12]. Technological constraints, market risks, and policy risks will restrict low-carbon production of industrial enterprises, while low-carbon life attitudes, government policies, social norms, and the quality and price of low-carbon products will affect residents' low-carbon consumption [13]. Financial technology can promote the development of green finance, so effective measures can be taken from three aspects: top-level design, technology research, and supervision [14]. Conformity psychology and ecological value perception have a positive impact on low-carbon consumption intention, and age and monthly income have a negative impact on low-carbon consumption behavior [15]. The government performance appraisal system, the attitude of enterprise executives, and consumers' consumption will affect the decision-making of the three subjects. Suggestions to promote low-carbon consumption can be put forward from the above aspects [16]. There is a significant positive correlation between ecological personality and low-carbon consumption behavior, in which ecological agreeableness and ecological responsibility are the main influencing factors, and urban residents' ecological personality shaping policies and low-carbon consumption behavior guidance policies are put forward, in order to promote low-carbon consumption behavior [17]. Low-carbon awareness, low-carbon knowledge, personal norms, social norms, and situational factors have an impact on residents' low-carbon behavior, and situational factors have an inhibitory effect on private and public low-carbon behavior [18]. Psychological factors, demographic factors, family factors, and situational factors will affect residents' low-carbon consumption behavior [19]. Attitudes, subjective norms, and perceived behavior control have a significant positive impact on low-carbon consumption behavior intention, and collectivist values have a significant direct positive impact on low-carbon consumption behavior intention [20]. Attitudes, situations,

habits, policies and regulations, economic costs, and social norms will affect their low-carbon consumption behavior and put forward suggestions to guide college students' low-carbon consumption from the government and school levels [21].

1.3. Research on Low-Carbon Consumption Countermeasures. Taking measures from participants, product specifications, market cultivation, publicity and education, consumption scenes and other aspects can effectively solve the problem of imperfect low-carbon consumption market [22]. We should guide the green transformation of consumption mode and promote the realization of carbon peak and carbon neutralization from the consumer side by improving consumer awareness, optimizing consumption policy design, tapping the potential of cities as key areas of emission reduction, paying attention to informal institutional factors, and encouraging low-carbon consumption in key areas of emission reduction such as transportation and construction [23]. The implementation of carbon tax policy can reduce carbon emissions to a certain extent. The strategy of combining repurchase and subsidy can reduce emissions and improve economic benefits at the same time [24]. The theoretical model of system situation behavior can be used for reference to promote the development of residents' low-carbon consumption behavior from the aspects of establishing low-carbon consumption values, establishing low-carbon consumption ethics, abandoning high-carbon consumption habits, and creating a low-carbon consumption atmosphere [25]. Comprehensive fitness can promote people to participate in leisure fitness, enhance physique, and achieve physical fitness [26]. The introduction of "boosting" policies such as energy labels, reconstruction of information presentation, provision of normative information feedback, and improvement of personal education and energy literacy can effectively reduce the energy efficiency gap and cultivate low-carbon consumption habits [27]. In order to reduce the environmental pollution caused by abandoned household medical devices, the government can take dynamic punishment and dynamic subsidy measures [28]. Through the concept of low-carbon consumption, guide consumers from meeting their desires to meeting their needs, so as to curb their excessive consumption behavior [29]. The development of industry can promote economic development, but it will also produce a lot of carbon emissions, which will harm the environment [30]. There is a balance point of game among consumers, enterprises, and the government, which can build a low-carbon consumption guidance mechanism with enterprises as leverage [31]. Increasing the intensity of supervision and punishment can affect the "free riding" behavior of enterprises and promote green emission reduction [32, 33].

To sum up, it can be found that the factors affecting the low-carbon consumption of fresh products mainly include policies, products, cognition, and values. The countermeasures and suggestions put forward by the above researchers mainly include improving the awareness of low-carbon

consumption and issuing relevant policies. However, with the continuous development of economy and society, with the improvement of the education level of the whole people and other factors, residents' cognition and consumption concept will also change. The existing studies do not consider low-carbon consumption comprehensively and do not integrate the consideration of fresh products. Therefore, this study combines reality, combs the existing literature, carries out division again comprehensively, considers various factors, analyzes the influencing factors affecting residents' low-carbon consumption willingness and low-carbon consumption behavior of fresh food, and puts forward corresponding countermeasures and suggestions.

2. Research Methods and Variable Design

2.1. Research Method. Low-carbon consumption means green consumption and sustainable consumption. Low-carbon consumption intention is people's idea of low-carbon consumption, and low-carbon consumption behavior is people's behavior of low-carbon consumption. Because the explanatory variable of this paper is residents' "low-carbon consumption willingness," it can be divided into "willing" and "unwilling". Residents' "low-carbon consumption behavior" can be divided into "yes" and "no." Both "low-carbon consumption willingness" and "low-carbon consumption behavior" are binary variables, which cannot meet the preconditions and assumptions of general regression analysis and the value requirements of explained variables in general linear regression analysis. Therefore, it cannot be analyzed with general linear regression model. Combined with the actual situation and considering various factors, the explanatory variables designed in this paper include both numerical variables and subtype variables. Therefore, this paper selects the binary logistic model to conduct regression analysis on the residents' low-carbon consumption willingness and low-carbon consumption behavior of fresh food, set as the probability of occurrence of residents' low-carbon consumption intention (behavior) of fresh products, and the value range is $[0, 1]$; then $P/(1 - P)$ represents the probability of occurrence of low-carbon consumption intention (behavior) of fresh products and the probability of nonoccurrence of low-carbon consumption intention (behavior) of fresh products; $\ln(P/(1 - P))$ can be obtained by taking logarithm; then we can get $P = 1/(1 + e^{-(w_0 + w_1 x_1 + w_2 x_2 + \cdots + w_n x_n)})$; it is logistic regression model. Among them, w_0 is a constant, x_1, $x_2, \ldots, x_n$ is the explanatory variable, there are n explanatory variables, which are n influencing factors of low-carbon consumption intention (behavior) of fresh food, and w_1, $w_2, \ldots, w_n$ is the regression coefficient. Combined with the reality of this paper, the explanatory variable is set to $y_i (i = 1, 2)$, y_1 indicates low-carbon consumption willingness, y_2 indicates low-carbon consumption behavior, and $y_i = \begin{cases} 0, & \text{yes} \\ 1, & \text{no} \end{cases}$. Set the explanatory variable to $x_{ij} (i = 1, 2, \ldots, 5; j = 1, 2, \ldots, 8)$, representing the j-th variable of the i-th dimension.

2.2. Variable Design. According to the research theme, combined with the existing relevant literature, this paper uses the questionnaire survey method to carry out the research, sets up two explanatory variables of "low-carbon consumption intention" and "low-carbon consumption behavior" of fresh products, and sets the explanatory variables into six aspects: demographic factors, psychological factors, low-carbon related knowledge of fresh products, external factors, policy norms, and product factors, with a total of 35 variables. Among them, demographic factors include gender, age, education level, and monthly income; psychological factors include trying new products, the influence of people around, recommending products, improving the quality of life, paying attention to global warming, saving energy, making contributions, and working together; the low-carbon knowledge of fresh food includes seven variables: understanding low-carbon, paying attention to low-carbon related issues, sharing low-carbon knowledge, understanding the importance of low-carbon, knowing how to reduce carbon emission, giving practice, and encouraging others to reduce carbon; external factors include six variables: practical publicity content, effective educational activities, convenient purchase of products, fake and shoddy products, many types of products, and smooth purchase channels; policy norms include four factors: government subsidies, government taxation, ignoring incentives, and avoiding punishment; product factors include six factors: low-carbon fresh product quality, cost performance. Among them, psychological factors, fresh low-carbon related knowledge, external factors, policy norms, and product factors are investigated in the form of Likert five-level scale. Each question is set with five options of "very disagree," "relatively disagree," "general," "relatively agree," and "very agree," which are recorded as 1, 2, 3, 4, and 5, respectively.

3. Results Analysis

The research and analysis data came from the research group from January 2022 to March 2022. Due to the epidemic situation, we adopted the method of random sampling and conducted an online survey on Shanghai residents by using the method of questionnaire; 190 questionnaires were collected this time. After reviewing and proofreading the collected questionnaires, it was found that the contents of 4 questionnaires were incomplete, so they were eliminated as invalid questionnaires. A total of 186 valid questionnaires were formed, and the effective recovery rate of the final questionnaire reached 97.89%. There were 37 variables in this questionnaire, and the number of valid questionnaires recovered was more than five times the number of variables. Therefore, questionnaire analysis can be carried out.

This paper uses SPSS25 to analyze the collected data. Firstly, it makes a descriptive statistical analysis on the collected samples to check whether the samples are well representative. Secondly, it tests the reliability and validity of the collected questionnaire data and then centralizes the questionnaire data to facilitate more effective regression analysis; centralization means that the explanatory variable and the explained variable subtract their own average value,

respectively. Finally, the "low-carbon consumption intention" and "low-carbon consumption behavior" are analyzed by binary logistic regression from five aspects: psychological factors, low-carbon related knowledge of fresh products, external factors, policy norms, and product factors, to explore the factors and influence degree of residents' low-carbon consumption intention and behavior of fresh products and then put forward targeted countermeasures and suggestions.

3.1. Descriptive Analysis. Figure 2 reveals that the numerical characteristics of demographic factors reflect the distribution of the respondents. The basic characteristics of the sample are as follows: there are 78 males, accounting for 41.94%, and 108 females, accounting for 58.06%. In terms of age distribution, it is mainly concentrated in the youth group aged 21–30, with the number reaching 101, accounting for 54.30%. The overall proportion distribution is in the shape of olive. In terms of education level, there are 110 college or undergraduate students, accounting for 59.14% of the total; there are 45 graduate students and above, accounting for 24.19% of the total; there are 31 people in senior high school and below, accounting for 16.67% of the total. It can be seen that the education is mainly concentrated in junior college or undergraduate, and the residents of other education levels are evenly distributed. From the perspective of monthly income, it is mainly distributed at 5000 yuan and below, followed by 5000–8000 yuan. The samples of other monthly income levels also account for a certain proportion. Overall, the distribution of the demographic data of the survey sample is reasonable and representative, which is suitable for the data analysis of this study.

3.2. Reliability and Validity Analysis

3.2.1. Reliability Analysis. The value range of reliability coefficient is 0-1. The closer it is to 1, the higher the reliability. SPSS is used to analyze the reliability of each dimension and the whole. From Table 1, we can find that, in terms of psychological factors, the overall standardized reliability coefficient is 0.914; in terms of low-carbon related knowledge of fresh products, the overall standardized reliability coefficient is 0.923; in terms of external factors, the overall standardized reliability coefficient is 0.909; in terms of policy norms, the overall standardized reliability coefficient is 0.869; in terms of product factors, the overall standardized reliability coefficient is 0.916. At the same time, the reliability coefficients of specific factors of psychological factors were 0.906, 0.906, 0.902, 0.898, 0.905, 0.899, 0.906, and 0.898, respectively; the reliability coefficients of specific factors of low-carbon related knowledge were 0.914, 0.909, 0.913, 0.911, 0.909, 0.913, and 0.911, respectively; the detailed reliability coefficients of external factors were 0.887, 0.896, 0.886, 0.901, 0.888, and 0.891, respectively; the reliability coefficients of specific factors of policy norms are 0.846, 0.821, 0.828, and 0.837, respectively; the reliability coefficients of specific factors of product factors
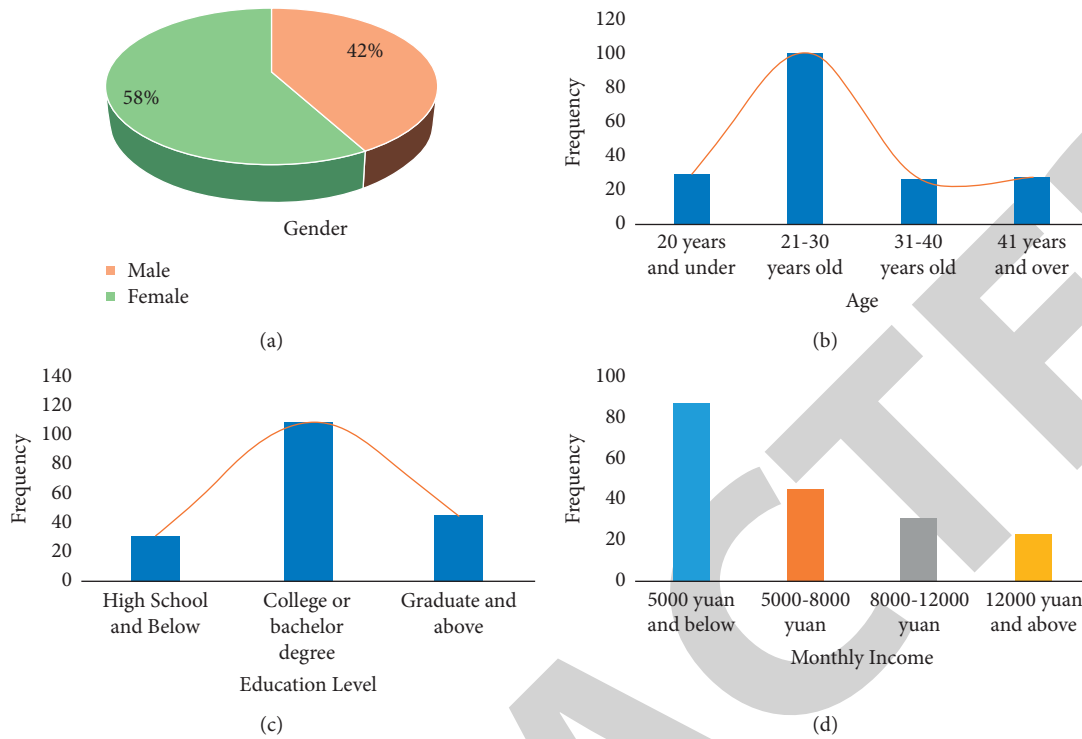
Figure 2: Descriptive analysis of demographic factors.

Table 1: Analysis results of each dimension and overall reliability.

Analysis results of each dimension and overall questionnaire	
Option	Standardized reliability coefficient
Psychological factor	0.914
Low-carbon related knowledge of fresh products	0.923
External factors	0.909
Policy norms	0.869
Product factors	0.916
Totality	0.978

are 0.903, 0.9, 0.905, and 0.895, respectively. We can find that the reliability coefficient after deleting the items of the above dimensions is less than the overall standardized reliability coefficient. Therefore, the dimensions of psychological factors, low-carbon related knowledge of fresh products, external factors, policy norms, and product factors have high reliability, and the internal consistency of each dimension is good. The title does not need to be adjusted. Finally, the overall reliability is analyzed, and the standardized Cronbach coefficient is 0.978, indicating that the overall reliability of the questionnaire is very high.

3.2.2. Validity Analysis. The coefficient of KMO test ranges from 0 to 1. The closer it is to 1, the better the validity of the questionnaire. According to the results of exploratory factor analysis above, the coefficient result of this KMO

test is 0.975, indicating that the validity of the questionnaire is relatively good.

Through the above analysis, it can be seen that the reliability and validity of the questionnaire data are relatively high, and the next regression analysis can be carried out on the questionnaire data.

3.3. Binary Logistic Regression Analysis. Binary logistic regression analysis was conducted with "low-carbon consumption intention" and "low-carbon consumption behavior" of fresh products as explanatory variables, respectively. Tables 2 and 3 depict the regression results of low-carbon consumption intention after deleting insignificant variables.

The regression results show the following:

(1) Low-carbon consumption intention: the significance of being willing to try new fresh products is 0.002, which is less than the given significance level of 0.05, indicating that trying new fresh products has a significant positive impact on residents' low-carbon consumption intention, and the influence coefficient is 1.646, indicating that residents' low-carbon consumption intention is closely related to new products. The significance of recommending fresh products to others is 0.021, which is less than the given significance level of 0.05, indicating that recommending fresh products to others has a significant positive impact on residents' low-carbon consumption intention, and the influence coefficient is 1.331, indicating that the more the residents are

Table 2: Logistic regression results of low-carbon consumption intention.

Variable options	Logistic model regression results		
	Low-carbon consumption willingness		
	Coefficient	Significance	Exp(B)
I am willing to try new products	1.646	0.002	0.193
I will recommend my products to others	1.331	0.021	3.784
I should make a contribution to reducing carbon emissions	1.460	0.009	0.232
I understand the importance of low-carbon behavior	1.206	0.027	0.299
Government taxation contributes to low-carbon consumption	1.260	0.039	3.526
I will consider the cost performance of the product	−1.257	0.013	0.285
Reducing the price of low-carbon products will help China's low-carbon consumption	1.975	0.007	7.205
Constant		−1.723	

Table 3: Logistic regression results of low-carbon consumption behavior.

Variable options	Logistic model regression results		
	Low-carbon consumption behavior		
	Coefficient	Significance	Exp(B)
There are fake and shoddy products in the market	−0.882	0.049	0.414
In order to avoid punishment, I will take the initiative of low-carbon consumption	1.527	0.013	4.604
I'm not sure if some fresh products are really low-carbon	−1.325	0.048	0.266
Constant		−1.695	

willing to recommend fresh products, the higher their low-carbon consumption intention of fresh products is. The significance of the contribution that should be made to carbon emission reduction is 0.009, which is less than the given significance level of 0.05, indicating that the contribution that should be made has a significant positive impact on the willingness of low-carbon consumption, and the influence coefficient is 1.460, indicating that residents have a strong sense of responsibility in low-carbon consumption. The significance of understanding the importance of low-carbon behavior is 0.027, which is less than the given significance level of 0.05, indicating that understanding the importance of low-carbon behavior has a significant positive impact on low-carbon consumption intention, and the influence coefficient is 1.206, indicating that residents' understanding of low-carbon

consumption is conducive to their willingness to produce low-carbon consumption. The significance that government taxation contributes to low-carbon consumption is 0.039, which is less than the given significance level of 0.05, indicating that government taxation has a significant positive impact on low-carbon consumption intention, and the influence coefficient is 1.260, indicating that taxation can enhance residents' low-carbon consumption intention. Considering that the significance of the cost performance of products is 0.013, it shows that the cost performance of fresh products has a significant negative impact on low-carbon consumption intention, and the influence coefficient is 1.257. The significance of reducing the price of low-carbon fresh products to low-carbon consumption is 0.007, which is less than the given significance level of 0.05, indicating that reducing the price of carbon fresh products has a significant positive impact on the willingness of low-carbon consumption, and the influence coefficient is 1.975, indicating that residents pay more attention to the quality and price of low-carbon fresh products, which provides development space for enterprises to launch high-quality and low-cost low-carbon fresh products and also puts forward new requirements. Through the above analysis, we can get the regression model of low-carbon consumption intention of fresh products:

$$P(y_1 = 1|x_{ij}) = \frac{1}{1 + e^{-X_1}},$$

$$X_1 = -1.723 + 1.646x_{21} + 1.331x_{23}$$

$$+ 1.460x_{27} + 1.206x_{34} + 1.260x_{52} \quad (1)$$

$$- 1.257x_{62} + 1.975x_{66}.$$

The regression results show the following:

(2) Low-carbon consumption behavior: the significance of fake and shoddy products in the market is 0.049, which is less than the given significance level of 0.05, indicating that the existence of fake and shoddy products in the market has a significant negative impact on residents' low-carbon consumption behavior, and the influence coefficient is 0.882, indicating that the less fake and shoddy products in the market, the more conducive to more residents' low-carbon consumption behavior. The significance of active low-carbon consumption to avoid punishment is 0.013, which is less than the given significance level of 0.05, indicating that active low-carbon consumption to avoid punishment has a significant positive impact on residents' low-carbon consumption behavior, and the influence coefficient is 1.527, indicating that appropriate mandatory measures can help to improve residents' low-carbon consumption behavior. It is

impossible to determine whether some fresh products are really low-carbon. The significance is 0.048, which is less than the given significance level of 0.05, indicating that whether fresh products are really low-carbon has a significant negative impact on residents' low-carbon consumption behavior, and the influence coefficient is 1.325, indicating that, in order to promote residents' low-carbon consumption behavior, it is very necessary to supervise and popularize the low-carbon nature of fresh products and how to identify whether fresh products are low-carbon. Through the above analysis, it can be concluded that the regression model of low-carbon consumption behavior is

$$P\left(y_2 = 1 | x_{ij}\right) = \frac{1}{1 + e^{-X_2}},$$

$$X_2 = -1.695 - 0.882 x_{44} + 1.527 x_{54} - 1.325 x_{63}.$$

(2)

3.4. Model Check.

Firstly, the Hosmer-Lemeshow test table of the binary logistic model based on low-carbon consumption intention is 0.986, which is greater than the given significance level of 0.05, indicating that the difference between the observed value and the expected value is not significant, indicating that the model has a good fit. At the same time, the overall prediction accuracy of the binary logistic model established with "low-carbon consumption intention" as the explanatory variable has reached 90.3%, indicating that the prediction effect is good and the accuracy is high. Secondly, the significance of the Hosmer-Lemeshow test table of the binary logistic model based on low-carbon consumption behavior is 0.436, which is greater than the given significance level of 0.05, indicating that the difference between the distribution of the observed value and the expected value is not significant, indicating that the fitting degree of the model is good. Finally, the overall prediction accuracy of the binary logistic model established with "low-carbon consumption behavior" as the explanatory variable reached 92.5%, indicating that the prediction effect is good and the accuracy is high. In summary, the model established in this paper has practical significance.

4. Conclusions and Recommendations

4.1. Conclusion.

Through the research, it can be found that the main factors affecting residents' low-carbon consumption intention are whether residents are willing to try new fresh products, whether residents are willing to recommend their purchased fresh products to others, residents' sense of responsibility to contribute to carbon emission reduction, awareness of the importance of low-carbon behavior, government taxes, the quality of fresh products, and the price of fresh products. The main factors affecting residents' low-carbon consumption behavior are

whether there are fake and shoddy products in the market, whether residents will consume low-carbon in order to avoid punishment, and whether fresh products are really low-carbon. Through the binary logistic regression model, the factors affecting the low-carbon consumption of fresh products are found out. The fitting degree of the model in this paper is higher than that in the past, reaching more than 90%. Next, this paper considers further optimizing the model to improve the fitting effect and fit the actual situation more closely.

4.2. Recommendations.

Through the above research, we can draw the main factors affecting residents' willingness and behavior of low-carbon consumption of fresh food. Because the government plays a guiding role in low-carbon consumption, enterprises, as suppliers of low-carbon consumption products, build a bridge between the government and residents and play an intermediary role. Residents, as practitioners of low-carbon consumption, can test the effectiveness of government guidance and products supplied by enterprises. As the main body of low-carbon consumption, Figure 3 reveals the role of them in low-carbon consumption. It can be seen that, in order to better improve residents' low-carbon consumption willingness and promote residents' low-carbon consumption behavior, the joint efforts of the government, enterprises, and residents are needed.

4.2.1. Government.

Firstly, take necessary mandatory measures to guide and regulate residents' low-carbon consumption willingness, introduce relevant laws and regulations that help residents to carry out low-carbon consumption of fresh products, give certain rewards to residents who take the initiative to implement low-carbon consumption, and take certain punitive measures for those who violate relevant regulations.

Secondly, give full play to the regulatory role of tax. Because the price of low-carbon fresh products has a certain impact on consumer demand, the government can provide financial subsidies for the purchase of low-carbon fresh products and appropriately adjust the consumption tax of low-carbon fresh products, and effective material incentives can enhance residents' low-carbon consumption willingness. At the same time, for enterprises providing low-carbon products, based on a certain tax preference, it can reduce the operating cost of enterprises, indirectly reduce the price of low-carbon fresh products, and then effectively attract residents to buy low-carbon fresh products.

Thirdly, encourage the innovation and R&D of low-carbon technologies, provide infrastructure conditions for R&D, award corresponding awards and bonuses to individuals and teams who make achievements, and improve the corresponding intellectual property law to protect R&D achievements. At the same time, it can also give full play to the economic value of intellectual property and give impetus to individual and team R&D.
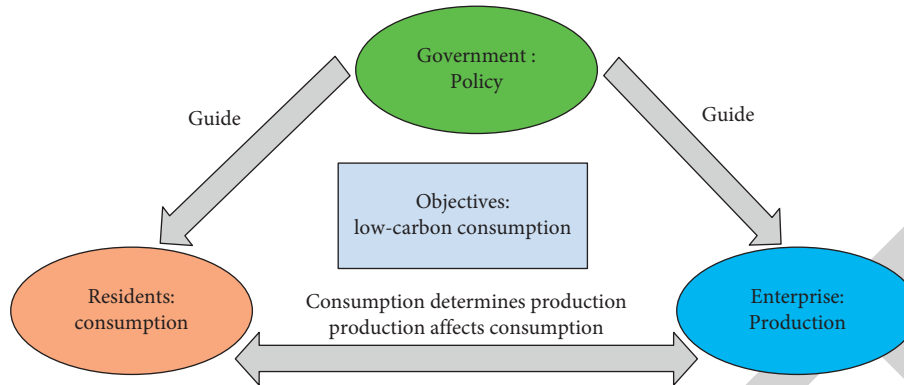
Figure 3: Role relationship of low-carbon actors.

Fourth, strengthen publicity and education, publicize low-carbon consumption in schools, communities, shopping malls, and other places, quantify the benefits of low-carbon consumption to residents, improve residents' attention to low-carbon consumption, and enhance residents' sense of responsibility for low-carbon consumption.

4.2.2. Enterprise. Firstly, with the improvement of residents' lives, the trend of increasing consumption in the market is gradually emerging. Enterprises should strengthen the research and development of low-carbon environmental protection technology, energy-saving technology, and energy technology. At the same time, enterprises can also cooperate with colleges and universities and introduce talents from colleges and universities to promote the research and development of low-carbon fresh product technology, so as to produce more kinds of low-carbon fresh products.

Secondly, based on the needs of consumers, carry out market segmentation of low-carbon fresh products, develop appropriate low-carbon fresh products, make classification marks in the sales and circulation of products, guide consumers to use low-carbon fresh products, and improve consumers' selection space and discrimination ability of low-carbon fresh products.

Thirdly, pay attention to improving the performance of low-carbon fresh products. In the process of product circulation, enterprises should take the initiative to bear social responsibility to avoid flooding the market with fake and shoddy products and affecting residents' confidence in low-carbon fresh products. At the same time, enterprises should abide by market rules, moderately reduce the price of low-carbon fresh products, and provide more high-quality low-carbon fresh products and low-carbon services.

4.2.3. Residents. Firstly, as the main body of market consumption, while safeguarding their own rights and interests, residents should also actively assume social responsibility, consciously establish and cultivate the values of low-carbon consumption, actively participate in public welfare low-carbon activities organized by the government and social media, constantly learn the knowledge of low-carbon consumption, and distinguish the authenticity and quality of low-carbon fresh products.

Secondly, residents should implement low-carbon consumption and effectively achieve low-carbon consumption in their lives, such as consuming low-carbon fresh products as much as possible and reducing the consumption of fresh products with high-carbon emissions.

Thirdly, as a main body of society, residents cannot only receive the publicity and education of low-carbon knowledge, but also spread the correct low-carbon consumption concept and knowledge to the surrounding people, which will help to form a good social atmosphere in which low-carbon consumption is everyone's responsibility and low-carbon consumption starts from me.

5. Conclusion

Based on the binary logistic regression model, this paper analyzes the influencing factors of residents' willingness and behavior of low-carbon consumption of fresh food. Firstly, the descriptive analysis of the data is carried out, followed by the reliability and validity test, and then the willingness and behavior are regressed, respectively, to explore the factors affecting residents' low-carbon consumption. Finally, the relevant suggestions are given from the three aspects of government, enterprises, and residents. This paper attempts to use the quantitative model method to study the influencing factors of residents' low-carbon consumption, which is a good supplement to a large number of qualitative research and has strong practical significance.

Data Availability

The simulation experiment data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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