## Research Report on the Influencing Factors of Zero Carbon Agricultural Products Market Sales: Take Chongqing as an Example

## Yilin Chen\*, Jinwei Li, Luyao Guo

School of Economics and Finance, Chongqing University of Science and Technology, Chongqing, China \*Corresponding Author

**Abstract: Promoting green and low-carbon** development in the economy and society is a critical component of achieving high-quality growth. Green and low-carbon production and consumption patterns have become a trend. As an agricultural powerhouse, China has placed greater emphasis on carbon emissions during agricultural production and the quality of agricultural products. Consequently, terms such as carbon footprint, carbon labels, low-carbon agricultural products, and zero-carbon agricultural products have emerged. Among these. zero-carbon agricultural products belong to the green and low-carbon industry and play a significant role in supporting China's goals of peak carbon emissions and carbon neutrality. However, the development speed of zero-carbon agricultural products is currently slow, making it necessary and urgent to explore the factors affecting their market sales. To this end, based on existing literature, the research team first conducted field surveys in Chongqing, the region where the members of the survey group combination reside. using a of questionnaires and offline interviews to identify the influencing factors of the market sales of zero-carbon agricultural products. Subsequently, through the construction of mediation effect models and correlation analysis, the collected data were analyzed to uncover the reasons affecting the market sales of zero-carbon agricultural products. Finally, recommendations were proposed to address the issues in the market sales of zero-carbon agricultural products.

Keywords: Zero Carbon Agricultural

Products; Cognitive Trust; Emotional Trust; Premium Payment Willingness; Purchase Behavior

**1.** Current Situation of Production and Sales of Zero-Carbon Agricultural Products

#### 1.1 Conceptual Analysis of Zero-Carbon Agricultural Products

Zero carbon agricultural products, as the name suggests, have strict limits on carbon emissions. They are defined as agricultural products whose net greenhouse gas emissions from sowing to harvesting are less than or equal to zero.

Pollution-free agricultural products, green food and organic food all refer to safe food that meets certain standards. However, compared with zero-carbon agricultural products, they are not very strict in defining the carbon emission of products. The differences are as follows:

On the one hand, the quality standards vary. The quality standards for pollution-free agricultural products are roughly equivalent to those of ordinary food hygiene standards in China; green foods come in two grades, A and AA, with the Food and Agriculture Organization of the United Nations and the World Health Organization serving as the two certification bodies that set their quality standards; organic food quality standards refer the organic agriculture and product to processing standards of the European Union and the International Federation of Organic (1POAM) Agriculture Movements [1]. However, unlike these, organic food standards place greater emphasis on the naturalness of the production process based on traditional testing standards, and its quality standards are largely consistent with those of the AA grade of green foods [2]; zero-carbon agricultural products monitor net carbon emissions from crop cultivation to harvest, defined as zero or less than zero net carbon emissions, which is generally measured by detecting the amount of carbon sequestration in the soil.

On the other hand, the production mode is different. The production of pollution-free agricultural products pays attention to the quality of the growth environment, and when using chemical compounds, it reduces the net carbon emissions of crops and soil. While reducing the carbon emissions of crops, it also increases the amount of carbon sequestration in the soil, so as to achieve the goal of offsetting the carbon emissions generated in the production process [3].

## 1.2 Market Sales of Zero-Carbon Agricultural Products

Following "pollution-free food," "green food," and "organic food," "zero-carbon food" and "carbon-neutral food" have also entered the consumer market. Currently, the market share of low-carbon and zero-carbon agricultural products is relatively small, with policies and consumer awareness and recognition having a significant impact. On June 9, 2022, the first batch of zero-carbon certified organic vegetables was uniformly launched in all Hema stores nationwide. According to data released by the National Certification and Accreditation Administration, from June to December 2022, the sales of the first batch of zero-carbon organic vegetables by enterprises generally achieved double-digit growth [4], with increases ranging from 14% to 66%. Among them, Jiangsu Jintan No.1 Farm Technology Co., Ltd. 's sales of zero-carbon organic vegetables reached approximately 2.3 million yuan, a year-on-year increase of 66%. In terms of consumer purchasing intentions, a survey conducted by Nanjing Agricultural University showed that about 70-80% of consumers buy for health and food safety reasons, while 20-30% are motivated by environmental awareness to purchase zero-carbon agricultural products [5]. Based on Accenture's "2022 China Consumer Insights," 43% of respondents are willing to pay a premium for eco-friendly products, and the higher their income level, the stronger their willingness to pay for eco-characteristics.

## 2. Design of Market Sales Survey of Zero-Carbon Agricultural Products: Taking Chongqing as an Example

## 2.1 Basic Information of the Survey Area

## 2.1.1 Selection of research area

As of August 2023, China's zero-carbon agricultural product certification has covered nine provinces including Jiangsu, Chongqing, Hubei, and Fujian. The national approval of the "Wuhan City Territorial Space General Plan (2021-2035)" has been granted to all 22 megacities and large cities nationwide. Among them, Beijing, Tianjin, Shanghai, Chongqing, and Guangzhou are positioned as "important central cities" in China. Chongqing is the only municipality directly under the Central Government in central and western China, combining the policy advantages of a municipality with the scale of a provincial administrative region [6]. To effectively and targetedly analyze the factors more influencing consumer purchases of zero-carbon agricultural products, this project will primarily focus on Chongqing.

The members of this project team are mainly from Chongqing City, thus adopting a research of loop "local team-local issues-local solutions" [7]. Leveraging the cognitive genes deeply rooted in the Bashu region, they conduct surveys across Chongqing. This design is not only based on operational convenience but also stems from an academic judgment that Chongging serves as a "miniature model of China's western modernization complex system": the multidimensional contradictions within its provincial territory, the policy laboratory attributes resulting from the superposition of national strategies, and the regional synergy driven by the Chengdu-Chongqing twin-city drive collectively form a highly theoretical research field.

2.1.2 Basic information of Chongqing

In terms of policy support and top-level design, Chongqing Municipality relies on the national "dual carbon" goals (carbon peak by 2030, carbon neutrality by 2060) and the "Outline of the Construction Plan for the Chengdu-Chongqing Economic Circle," incorporating the green and low-carbon transformation of agriculture into key tasks. The "Chongqing Rural and Agricultural Emission Reduction and Carbon Sequestration Implementation Plan" released in 2022 explicitly requires the promotion of low-carbon planting techniques and the development of ecological circular agriculture. Chongqing has established the "Three Gorges Ecological Agriculture Reservoir Area Demonstration Zone" and piloted "zero-carbon agricultural subsidies" in counties such as Wushan and Fengjie [8]. In 2023, the Chongqing Department of Agriculture and Rural Affairs, in conjunction with the Environmental Protection Bureau, launched the "Zero-Carbon Agricultural Products Certification Standard," which includes details on carbon emission accounting and carbon offset mechanisms. As of 2023, there were 127 registered zero-carbon agricultural product enterprises in Chongqing, including state-owned enterprises, cooperatives, and private businesses. The main categories include high-altitude vegetables, organic tea, and low-carbon citrus fruits, with an annual production of about 150,000 tons of zero-carbon certified agricultural products, accounting for 2.3% of the city's total agricultural output. For supply chains and infrastructure, companies like JD Logistics and SF Express have laid out new energy cold chain fleets in Chongqing, achieving an electrification rate of 35% on delivery routes from the main urban area to districts and counties; Chongqing Transportation Group has launched a "zero-carbon agricultural products dedicated line," using hydrogen fuel cell trucks to transport Wushan crisp plums to coastal cities [9].

Chongqing's zero-carbon agricultural products market is in the stage of "transitioning from policy-driven to market-driven." Leveraging its advantages in mountainous ecological resources and policy innovation, it has made progress in technology application and brand building [10]. However, it still needs to further address bottlenecks related to costs, awareness, and talent. Currently, policy incentives for Chongqing's zero-carbon agricultural products are concentrated on the production end (such as subsidies and certification support), but the driving force at the consumption end is insufficient, leading to a mismatch between supply and demand in the market. Studying the factors influencing the sales of Chongqing's zero-carbon agricultural products

is not only a practical necessity for addressing the current disconnect between production and consumption but also an academic imperative for constructing a theoretical framework for the zero-carbon transformation of Chongqing's agricultural products [11]. This can further promote the market's transition from "policy incubation" to "self-sustaining," supporting the development of Chongqing's zero-carbon agricultural products market.

## 2.2 Research Hypothesis

According to the S-O-R theory, which stands for Stimulus-Organism-Response, the stimulus (S) in this paper refers to the ecological friendliness of zero-carbon agricultural products. The organism (O) affected by the stimulus is primarily the emotional state of consumers, including cognitive trust and affective trust. The behavioral response (R) is the willingness of consumers to pay a premium. The ecological friendliness of zero-carbon agricultural products, which helps with environmental protection, serves as the product attribute stimulus [12]. The premium payment behavior of consumers is the resulting reaction. Cognitive trust and affective trust are the organism responses of consumers, possibly playing a mediating role. Therefore, this study posits that cognitive trust and affective trust mediate the relationship between consumers' willingness to pay a premium for zero-carbon agricultural products [13].

purchasing For consumers zero-carbon agricultural products, they need to believe that contribute these products indeed to environmental protection and develop an emotional admiration and support for them. Consumers can perceive the environmental attributes of zero-carbon agricultural products at the cognitive level, and hold curiosity about them on an emotional level [14]. After rational thinking and judgment, they may develop cognitive and emotional trust in zero-carbon agricultural products. Based on the environmental attributes of zero-carbon agricultural products, consumers establish cognitive and emotional trust, which leads to a willingness to pay a premium. Therefore, we influence propose: consumers their willingness to pay a premium for zero-carbon agricultural products through two mediating variables—cognitive trust and emotional trust

[15].

## 2.3 Data Collection

The data collection for this survey was completed on March 2nd, primarily through online methods. A total of 426 responses were collected, with an effective response rate of 85%, resulting in 426 valid entries. Using SPSSAU software, descriptive statistical analysis can be performed to describe the basic characteristics of the data, including the frequency, percentage, and proportion of each of the six sample features.

The number of female respondents in the questionnaire sample is more than that of male respondents, and the number of 18-25 years old accounts for 64.8% of the total number. Most of them have a bachelor's degree or junior college degree, accounting for 63.1% of the total number. Most of the respondents have not bought zero-carbon agricultural products, which also shows that the popularity of zero-carbon agricultural products is not enough, and the market promotion is not enough.

## 2.4 Research Findings

Through the integration and analysis of questionnaire data and interview research, the following conclusions can be drawn:

1. In terms of gender, women have a higher awareness of zero-carbon agricultural products and buy them more often.

2. The majority of people with a strong willingness to pay for zero-carbon agricultural products are those with higher income, and nearly 95% of those willing to pay twice as much for zero-carbon agricultural products as ordinary agricultural products are those with an income of more than 9001 yuan.

3. People with higher education have strong emotional trust, cognitive trust and premium payment willingness for zero-carbon agricultural products.

4. According to the information of 426 samples, 70.4% of them have not bought zero-carbon agricultural products, and 91.4% of them think there are too few ways to buy

zero-carbon agricultural products.

5. Among the people who have bought in the sample, 63.41% only buy once a week, and only 7.32% buy more than four times a week. Generally speaking, the purchase rate is low.

6. Only 30.6% of the sample people pay attention to and understand zero carbon agricultural products, while 69.4% do not know or are not clear about zero carbon agricultural products. The awareness of zero carbon agricultural products in the society is generally low.

## 3 Statistical Analysis of Influencing Factors on Market Sales of Zero-Carbon Agricultural Products

## **3.1 Selection of Evaluation Factors**

Zero-carbon agricultural products belong to the category of trust-based agricultural products, with many of their attributes falling under the trust attribute. In green consumption, the trust attribute of zero-carbon agricultural products plays a crucial role. The price of zero-carbon food is higher than that of regular food, meaning consumers need to spend more money on zero-carbon agricultural products. Whether consumers are willing to pay a premium for the trust attribute is key to understanding consumer purchasing behavior regarding zero-carbon agricultural products. Therefore, this study introduces emotional trust and cognitive trust as two evaluation factors as mediating variables, constructing a model to investigate the impact of the trust attribute of zero-carbon agricultural products on the willingness to pay a premium.

Based on the data obtained from Questionnaire Star, we also selected the age, occupation, education level and cognition information of consumers about zero-carbon agricultural products as evaluation factors to study the correlation between consumers' personal basic information and zero-carbon agricultural product purchase behavior.

## **3.2 Reliability and Validity Test** (1) Reliability test

Table 1. Reliability Analysis Table										
Cronbach Reliability analysis										
	Correlation of the	The $\alpha$ system	Cronbach							
name	total correction	has been deleted	a Series							
	items(CITC)	count	count							
Please choose the most appropriate item according to	point seven two	point eight eight	point							

www.esteral.aiterations.1. >5 manual resulting and > second										
your actual situation: 1>5 means very disagree> very	nine	SIX	nine zero							
agree-I am willing to spend more money			one							
Buy zero-carbon produce, not general produce.										
For me, it's worth buying zero-carbon produce, even	point seven nine	point eight eight								
though it's expensive.	eight	two								
I am willing to pay a high price for zero-carbon	naint air air air	point eight nine								
agricultural products.	point six six six	one								
I trust zono contron muchuos	point six seven	point eight nine								
i trust zero-carbon produce.	three	zero								
I believe zero-carbon agricultural products can help the	point six one	point eight nine								
environment.	three	four								
I think zero-carbon agricultural products are no different	point four two	point nine zero								
from ordinary agricultural products.	four	seven								
11. People around me are more supportive of	point seven five	point eight eight								
zero-carbon agricultural products.	two	six								
I am curious about the new thing of zero-carbon	u aline aline aline aline	point eight nine								
agricultural products.	point six six six	one								
I think there are too few ways to buy zero-carbon	point six one	point eight nine								
produce.	three	four								
I pay attention to and understand zero-carbon	point six three	point eight nine								
agricultural products.	two	three								
Standardized Cronbach α co	Standardized Cronbach α coefficient: 0.903									

As shown in Table 1, the reliability coefficient is 0.901, which is greater than 0.9, indicating that the research data has a very high level of reliability. Regarding the "a coefficient for items that have been deleted," if I were to delete it, the reliability coefficient would significantly increase; therefore, this item can be considered for correction or deletion. For the "CITC value," the CITC values of all analysis items are above 0.4, indicating good correlation between the analysis items and also suggesting a high reliability level. In summary, the reliability coefficient of the research data is higher than 0.9, comprehensively demonstrating the high quality of the data's reliability, making it

suitable for further analysis.

(2) Validity test

As shown in Table 2, the commonality values for all research items are above 0.4, indicating that the information from the research items can be effectively extracted. The KMO value is 0.843, greater than 0.6, suggesting that the data can be effectively utilized and extracted. Additionally. information the variance explained by the two factors are 33.058% and 32.901%, respectively. After rotation, the cumulative variance explained rate is 65.959% > 50%. This indicates that the information content of the research items can be effectively extracted.

	U		
Table 2	. Results	of Validity	Analysis

	Factor	loadings	Commonality
name	factor 1	factor 2	(common factor
			equation difference)
1. Please choose the most appropriate item according to			
your actual situation: 1>5 means very disagree> very	point four	noint souon	
agreeI am willing to spend more money to buy	point iour		point six seven six
zero-carbon agricultural products, and	two seven	zero two	
Not a normal agricultural product.			
For me, it's worth buying zero-carbon produce, even	point five	point six	noint seven four six
though it's expensive.	four one seven three		point seven four six
I am willing to pay a high price for zero-carbon	point two	point seven	noint six source four
agricultural products.	eight three	seven one	point six seven iour
I trust zoro parhan produco	point six	point four	noint six zoro nino
i irusi zero-carbon produce.	six two	one four	point six zero nine

I believe zero-carbon agricultural products can help the	point nine point zero		point eight two zero	
environment.	zero zero	nine six	point eight two zero	
11. People around me are more supportive of	point five	point six	point six six five	
zero-carbon agricultural products.	zero two	four three		
I think zero-carbon agricultural products are no different from ordinary agricultural products.	negtive point zero three nine	point seven four five	point five five seven	
I think there are too few ways to buy zero-carbon	point seven	point two	point six one one	
produce.	five zero	two zero	point six one one	
I am curious about the new thing of zero-carbon	point seven	point two	noint six six six	
agricultural products.	seven two	six four		
I pay attention to and understand zero-carbon	point two	point six	noint five seven two	
agricultural products.	nine eight	nine five		
	five point	one point		
Characteristic root values (before rotation)	four one	one eight	-	
	one	five		
Variance explained (%) (pre-rotation)	54.105%	1.853%	-	
Cumulative variance explained (%) (pre-rotation)	54.105%	65.959%	-	
	three point	three point		
Characteristic root values (rotated)	three zero	two nine	-	
	six	zero		
Variance explained (%) (rotated)	33.058%	32.901%	-	
Cumulative variance explained (%) (rotated)	33.058%	65.959%	-	
KMO price	point eight	t four three	-	
Port's spherical value	eight hund	red and ten		
Dait's splicificat value	point four	one seven	-	
df	forty	v five	-	
p price	point zero	zero zero	-	

Note: If the numbers in the table are colored, blue indicates that the absolute value of the load coefficient is greater than 0.4, and red indicates that the common degree (common factor variance) is less than 0.4.

# **3.3 Mediation Effect Test of Cognitive Trust and Emotional Trust**

The Bootstrap interval method was used to test the mediating effect. If the confidence interval of the total indirect effect does not contain 0, it indicates that there is a mediating effect; otherwise, there is none. In AMOS24.0 software, Bootstrap sampling was set for 134 times, and the test results are shown in Table 3 and Table 4:

Item	Total indirect effect	Boot SE	z price	P price	Boot LLCl	Boot ULC
11. I trust zero-carbon agricultural products. =>11. Please choose the most appropriate item according to your actual situation: 1>5 means very disagree> very agreeI am willing to spend more money on zero-carbon agricultural products rather than general agricultural products.	0.066	0.068	0.977	0.329	-0.023	0.267
11. I think zero-carbon agricultural products are no different from ordinary agricultural products. =>11. Please choose the item that is most suitable according to your actual situation: 1>5 means very disagree> very agreeI am willing to spend more money to buy zero-carbon agricultural products instead of general agricultural products.	0.151	0.062	2.444	0.015	0.050	0.295
11. I believe that zero-carbon agricultural products can help the environment. =>11. Please choose the item that is most suitable	0.280	0.093	3.004	0.003	0.111	0.476

## Table 3. Total Indirect Effect of Emotional Trust

according to your actual situation: 1>5 means very disagree>										
very agreeI am willing to spend more money on zero-carbon										
agricultural products rather than general agricultural products.										
Sum of indirect effects	0.498	0.151	3.305	0.001	0.214	0.807				
Note: BootLLCl refers to the lower limit of the 95 % interval of Bootstrap sampling, ootULCl refers to the										
upper limit of the 9 5 % interval of Bootstrap sampling, and bootstra	ap type:	deviat	ion co	rrectio	on meth	ıod				

bootstrap

#### Table 4. Total Indirect Effect of Cognitive Trust

Item	Total indirect effect	Boot SE	z price	p price	BootLLCI	BootULCI
<ul> <li>11. People around me tend to advocate zero-carbon agricultural products. =&gt;11. Please choose the item that is most suitable according to your actual situation:</li> <li>1&gt;5 means very disagree&gt; very agreeI am willing to spend more money on zero-carbon agricultural products rather than general agricultural products.</li> </ul>	0.228	0.065	3.526	0.000	0.071	0.325
<ul> <li>11. I am curious about the new thing of zero-carbon agricultural products. =&gt;11. Please choose the most appropriate item according to your actual situation:</li> <li>1&gt;5 means very disagree&gt; very agreeI am willing to spend more money on zero-carbon agricultural products instead of ordinary agricultural products.</li> </ul>	0.081	0.053	1.531	0.126	0.000	0.215
<ul> <li>11. I pay attention to and understand zero-carbon agricultural products. =&gt;11. Please choose the most appropriate item according to your actual situation:</li> <li>1&gt;5 means very disagree&gt; very agreeI am willing to spend more money on zero-carbon agricultural products rather than general agricultural products.</li> </ul>	0.078	0.054	1.448	0.148	-0.011	0.200
Sum of indirect effects	0.388	0.112	3.474	0.001	0.108	0.556

Note: BootLLCl refers to the lower limit of the 95% interval of Bootstrap sampling, BootULCI refers to the upper limit of the 95% interval of Bootstrap sampling, bootstrap type: deviation correction bootstrap method

Table 3 and Table 4 show that the confidence intervals for the total indirect effects of affective trust and cognitive trust do not contain 0, indicating that both have played a mediating role. Furthermore, this study further compared the strength of the mediating roles of affective trust and cognitive trust. Using the SPSS22.0 Process plugin, two models were selected to test the mediating effects of affective trust and cognitive trust on different paths. The test results are shown in Table 5 and Table 6:

## Table 5. The Mediating Role of Emotional Trust

Summary of mediation test results										
Item	C gross effect	a	b	The value of the a*b mediation effect	a*b (BootSE)	a*b(z price)	a*b(p price)	a*b(95% BootCI)	C' direct effect	inspect the conclusion
11. I pay attention to and understand zero-carbon agricultural products. =>11. I trust zero-carbon agricultural products. =>11. Please choose the item that best fits your actual situation: 1>5 means very disagree-> very agreeI am willing to spend more money on zero-carbon agricultural products than on ordinary agricultural products.	0.123	0.071	0.446 **	0.032	0.046	0.698	0.485	-0.052~0 .133	-0.006	The role of mediation is not significant
11. I pay attention to and understand zero-carbon agricultural products. => 11. I believe there is no difference between zero-carbon agricultural products and ordinary agricultural products. => 11. Please choose the most suitable option based on your actual situation: 1->5 indicates strong disagreement-> strongly agree-I am willing to spend more on purchasing zero-carbon agricultural products rather than regular ones.	0.123	0.307	0.129	0.040	0.033	1.189	0.235	-0.001~0 .139	-0.006	The role of mediation is not significant

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<ul> <li>11. I pay attention to and understand zero-carbon agricultural products. =&gt; 11. I believe that zero-carbon agricultural products can contribute to environmental protection. =&gt; 11. Please choose the item that best fits your situation: 1-&gt;5 indicates strong disagreement- → strongly agree. I am willing to spend more money on zero-carbon agricultural products rather than regular ones.</li> </ul>	0.123	-0.28 4**	-0.20 2	0.057	0.046	1.258	0.208	-0.014~0 .173	-0.006	The role of mediation is not significant
<ul> <li>11. I am curious about the new thing of zero-carbon agricultural products. =&gt;11. I trust zero-carbon agricultural products. =&gt;11. Please choose the most suitable item according to your actual situation: 1-&gt;5 indicates very disagree-&gt; very agree-I am willing to spend more money on zero-carbon agricultural products instead of ordinary agricultural products.</li> </ul>	0.272* *	0.182 *	0.446 **	0.081	0.060	1.353	0.176	-0.005~0 .234	0.302**	Some intermediar ies
11. I am curious about the new concept of zero-carbon agricultural products. =>11. I believe there is no difference between zero-carbon agricultural products and ordinary agricultural products. =>11. Please choose the option that best fits your situation: 15 indicates strong disagreement to strongly agree. I am willing to spend more money on zero-carbon agricultural products rather than regular ones.	0.272*	0.058	0.129	0.008	0.017	0.439	0.661	-0.028~0 .044	0.302**	The role of mediation is not significant
<ul> <li>11. I am curious about the new concept of zero-carbon agricultural products. =&gt; 11. I believe that zero-carbon agricultural products can contribute to environmental protection. =&gt;</li> <li>11. Please choose the option that best fits your situation: 1&gt; 5 indicates strong disagreement-&gt;</li> <li>very agree-I am willing to spend more money on zero-carbon agricultural products instead of regular ones.</li> </ul>	0.272*	0.590 **	-0.20 2	-0.119	0.085	-1.406	0.160	-0.293~0 .041	0.302**	The role of mediation is not significant
11. People around me tend to favor zero-carbon agricultural products. =>11. I trust zero-carbon agricultural products. =>11. Please choose the one that best fits your actual situation: 1->5 means very disagree-> very agree-I am willing to spend more money on zero-carbon agricultural products than on ordinary ones.	0.395* *	0.459 **	0.446 *	* 0.205	0.070	2.943	0.003	0.053~0. 331	0.263*	Some intermediar ies
11. Most people around me advocate for zero-carbon agricultural products => 11. I believe there is no difference between zero-carbon agricultural products and ordinary agricultural products. => 11. Please choose the option that best fits your situation: 15 indicates strong disagreement to very agreeI am willing to spend more money on zero-carbon agricultural products rather than ordinary ones.	0.395* *	0.293 *	0.129	0.038	0.031	1.229	0.219	-0.002~0 .134	0.263*	The role of mediation is not significant
<ul> <li>11. Most people around me advocate for zero-carbon agricultural products. =&gt; 11. I believe that zero-carbon agricultural products can contribute to environmental protection. =&gt;</li> <li>11. Please choose the option that best fits your situation: 1-&gt;5 indicates strong disagreement-&gt;strong agreement I am willing to spend more money on zero-carbon agricultural products rather than regular ones.</li> </ul>	0.395* *	0.547 **	-0.20 2	-0.110	0.073	-1.517	0.129	-0.255~0 .036	0.263*	The role of mediation is not significant
		*1	o<0.05	**p<0.01						
bootst	rap Typ	e: dev	iation	correction bootst	trap metho	od				

## Table 6. The Mediating Role of Cognitive Trust

Summary of mediation test results										
Item	C gross effect	а	b	The value of the a*b mediation effect	a*b(B ootSE)	a*b (z price)	a*b (p price)	a*b(95% BootCI)	C' direct effect	inspect the conclusion
11. I pay attention to and understand zero-carbon agricultural products. =>11. I trust zero-carbon agricultural products. =>11. Please choose the item that best fits your actual situation: 1>5 means very disagree> very agree-I am willing to spend more money on zero-carbon agricultural	0.123	0.071	0.446 **	0.032	0.046	0.698	0.485	-0.052~0 .133	-0.006	The role of mediation is not signiicant

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products than on ordinary agricultural products										
<ul> <li>11. I pay attention ordinary eginetical products.</li> <li>11. I pay attention to and understand zero-carbon agricultural products. =&gt; 11. I believe there is no difference between zero-carbon agricultural products and ordinary agricultural products. =&gt; 11. Please choose the most suitable option based on your actual situation: 1-&gt;5 indicates strong disagreement-&gt; strongly agree-I am willing to spend more on purchasing zero-carbon agricultural products rather than regular ones.</li> </ul>	0.123	0.307	0.129	0.040	0.033	1.189	0.235	-0.001~0 .139	-0.006	The role of mediation is not significant
<ul> <li>11. I pay attention to and understand zero-carbon agricultural products. =&gt; 11. I believe that zero-carbon agricultural products can contribute to environmental protection. =&gt; 11. Please choose the option that best fits your situation:</li> <li>1-&gt;5 indicates strong disagreement- → strongly agree. I am willing to spend more money on zero-carbon agricultural products rather than regular ones.</li> </ul>	0.123	-0.28 4**	-0.20 2	0.057	0.046	1.258	0.208	-0.014~0 .173	-0.006	The role of mediation is not significant
11. I am curious about the new thing of zero-carbon agricultural products. =>11. I trust zero-carbon agricultural products. =>11. Please choose the most suitable item according to your actual situation: 1->5 indicates very disagree-> very agree-I am willing to spend more money on zero-carbon agricultural products instead of ordinary agricultural products.	0.272*	0.182 *	0.446 **	0.081	0.060	1.353	0.176	-0.005~0 .234	0.302	Some intermediarie s
<ul> <li>11. I am curious about the new concept of zero-carbon agricultural products. =&gt; 11. I believe there is no difference between zero-carbon agricultural products and ordinary agricultural products. =&gt; 11. Please choose the option that best fits your situation: 15 indicates strong disagreement to strongly agree. I am willing to pay more for zero-carbon agricultural products than for ordinary ones.</li> </ul>	0.272* *	0.058	0.129	0.008	0.017	0.439	0.661	-0.028~0 .044	0.302	The role of mediation is not significant
<ul> <li>11. I am curious about the new concept of zero-carbon agricultural products. =&gt; 11. I believe that zero-carbon agricultural products can contribute to environmental protection. =&gt; 11. Please choose the option that best fits your situation: 1&gt;5 indicates strong disagreement-&gt; very agree-I am willing to spend more money on zero-carbon agricultural products instead of regular ones.</li> </ul>	0.272*	0.590 **	-0.20 2	-0.119	0.085	-1.406	0.160	-0.293~0 .041	0.302 **	The role of mediation is not significant
11. People around me tend to favor zero-carbon agricultural products. =>11. I trust zero-carbon agricultural products. =>11. Please choose the one that best fits your actual situation: 1->5 means very disagree-> very agree-I am willing to spend more money on zero-carbon agricultural products than on ordinary ones.	0.395* *	0.459 **	0.446 *	* 0.205	0.070	2.943	0.003	0.053~0. 331	0.263	Some intermediarie s
11. Most people around me advocate for zero-carbon agricultural products => 11. I believe there is no difference between zero-carbon agricultural products and ordinary agricultural products. => 11. Please choose the option that best fits your situation: 15 indicates strong disagreement to strongly agreeI am willing to spend more money on zero-carbon agricultural products rather than regular ones.	0.395* *	0.293 *	0.129	0.038	0.031	1.229	0.219	-0.002~0 .134	0.263	The role of mediation is not significant
<ul> <li>11. Most people around me advocate for zero-carbon agricultural products. =&gt; 11. I</li> <li>believe that zero-carbon agricultural products can contribute to environmental protection. =&gt; 11.</li> <li>Please choose the option that best fits your situation: 1-&gt;5 indicates strong</li> <li>disagreement-&gt;strong agreement I am willing to spend more money on zero-carbon agricultural products rather than regular ones.</li> </ul>	0.395* *	0.547	-0.20 2	-0.110	0.073	-1.517	0.129	-0.255~0 .036	0.263	The role of mediation is not significant
<b></b>	T	*p	<0.05	**p<0.01		1				
Bootstr	ap Type	e: devi	ation c	correction bootstra	ap meth	od				
As shown in Table 5 and Table	6, ir	n the	e	"cogniti	ve	trust-	emot	ional	trus	t-premium

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payment willingness" path with "emotional trust" as the mediating variable, only four effects were not significant, indicating strong mediation. In the "emotional trust-cognitive trust-premium payment willingness" path with "cognitive trust" as the intermediate variable, seven effects were not significant, indicating weak mediation. This suggests that the mediating effect of emotional trust is stronger than that of cognitive trust, demonstrating the crucial role of emotional trust in the sales of zero-carbon agricultural products.

### 3.4 Chi-Square Analysis

Table 7. Chi-Square								
Analysis Cross (chi-square) analysis results _								
title	name	10. Zero-carbon agricultural products refer to agricultural products whose net greenhouse gas emissions are less than or equal to zero from sowing to harvesting in the process of agricultural production. How much higher is the price of zero-carbon agricultural products than that of ordinary agricultural products: (%)				amount to	X2	R
		More than 1	Within 20%	Less than 50%	Within 80%			
2. Your	woman	4(57.14)	50(52.08)	15(57.69)	4(80.00)	73(54.48)	one	noint
gender:	man	3(42.86)	46(47.92)	11(42.31)	1(20.00)	61(45.52)	point	six four
amount to		seven	Ninety six	twenty six	five	one hundred and thirty four	six six four	five
3. Your age:	Under 25 years old (inclusive)	2(28.57)	61(63.54)	19(73.08)	3(60.00)	85(63.43)		
	26-35 years old	0(0.00)	5(5.21)	2(7.69)	0(0.00)	7(5.22)		
	Age 36-44	0(0.00)	11(11.46)	3(11.54)	1(20.00)	15(11.19)	53.68 7	0.000**
	Age 45-60	0(0.00)	17(17.71)	0(0.00)	0(0.00)	17(12.69)		
	Over 60 years old	5(71.43)	2(2.08)	2(7.69)	1(20.00)	10(7.46)		
	amount to	seven	ninety six	twenty six	five	one hundred and thirty four		
4.Your educationa l backgroun d:	junior middle school	0(0.00)	10(10.42)	2(7.69)	1(20.00)	13(9.70)	forty nine point one three four	0.000**
	Bachelor's or associate degree	1(14.29)	60(62.50)	19(73.08)	3(60.00)	83(61.94)		
	Master's degree or above	6(85.71)	5(5.21)	3(11.54)	0(0.00)	14(10.45)		
	senior middle school	0(0.00)	21(21.88)	2(7.69)	1(20.00)	24(17.91)		
	amount to	seven	ninety six	twenty six	five	one hundred and thirty four		
5. Your occupation :	professional	1(14.29)	9(9.38)	1(3.85)	0(0.00)	11(8.21)	eighty eight point two four zero	0.000**
	Individual operators/contractors	0(0.00)	2(2.08)	2(7.69)	1(20.00)	5(3.73)		
	Business managers	0(0.00)	4(4.17)	0(0.00)	1(20.00)	5(3.73)		
	Agricultural, forestry, animal husbandry and fishery workers	0(0.00)	2(2.08)	0(0.00)	0(0.00)	2(1.49)		
	Commercial service workers	0(0.00)	3(3.13)	0(0.00)	0(0.00)	3(2.24)		
	student	0(0.00)	59(61.46)	18(69.23)	3(60.00)	80(59.70)		
	Government/agency officials/civil servants	2(28.57)	3(3.13)	2(7.69)	0(0.00)	7(5.22)		
	Ordinary staff	0(0.00)	6(6.25)	3(11.54)	0(0.00)	9(6.72)		
	professional	0(0.00)	7(7.29)	0(0.00)	0(0.00)	7(5.22)		
	retire	4(57.14)	1(1.04)	0(0.00)	0(0.00)	5(3.73)		
	amount to	seven	ninety six	twenty six	five	one hundred and thirty four		
6. Your	Under 3000 yuan	1(14.29)	65(67.71)	19(73.08)	2(40.00)	87(64.93)	thirty	
personal	3001-6000 yuan	0(0.00)	11(11.46)	4(15.38)	1(20.00)	6(11.94)	seven	
monthly	6001-9000 yuan	0(0.00)	11(11.46)	1(3.85)	0(0.00)	12(8.96)	point four six one	0.000**
income	More than 9,001 yuan	6(85.71)	9(9.38)	2(7.69)	2(40.00)	9(14.18)		
	amount to	seven	ninety six	twenty six	five	one hundred and thirty four		
*p<0.05**p<0.01								

As shown in Table 7, the chi-square test (cross-tabulation) was used to study the differences in consumers' willingness to pay a premium for zero-carbon agricultural products across five factors: gender, age, education level, occupation, and personal monthly income. From the table above, it can be seen that there is no significant difference in the

willingness to pay a premium for zero-carbon agricultural products among different consumers based on gender (p > 0.05), indicating that there is consistency in their willingness to pay a premium for zero-carbon agricultural products regardless of gender. Additionally, there is a significant difference in the willingness to pay a premium for zero-carbon agricultural products among different consumers based on age, education level, occupation, and personal monthly income (p < 0.05), indicating that there are differences in their willingness to pay a premium for zero-carbon agricultural products across these four factors. In summary, the willingness to pay a premium for zero-carbon agricultural products does not show significant differences based on gender, but it does show significant differences based on age, education level, occupation, and personal monthly income.

# 4 Research Conclusions and Countermeasures

#### 4.1 Research Conclusions

4.1.1 Basic conclusions

As the pace of China's green production and consumption policy transformation continues to accelerate, and with the continuous development of China's sustainable path, reducing carbon emissions from agricultural products and enhancing the carbon sequestration capacity of agriculture play a crucial role in achieving China's carbon peak and carbon neutrality goals. The development of zero-carbon agricultural products is precisely aimed at establishing a low-carbon consumption model centered on consumers. However, the current market for zero-carbon agricultural products still faces numerous challenges. This paper primarily focuses on the market sales of zero-carbon agricultural products to explore factors influencing their market sales. It investigates the impact of cognitive trust and emotional trust on consumers' willingness to pay premium through model building and data analysis, leading to the following conclusions:

(1) The chi-square test shows that age, occupation, education and monthly income have significant influence on consumers 'willingness to pay a premium for zero-carbon agricultural products, while gender has no significant influence on consumers' willingness to pay a premium for zero-carbon agricultural products.

(2) Through the test of mediation effect, it is concluded that cognitive trust and emotional trust both have an impact on consumers' willingness to pay premium.

(3) The Bootstrap interval method was used to test the mediating effect, and the mediating effect of emotional trust was stronger than that of cognitive trust, and emotional trust played an important role in it.

4.1.2 Problems existing in the zero-carbon agricultural products market

At present, there are still many problems in the production and sales of zero-carbon agricultural products.

First, the target market positioning is vague, and the segmented consumer needs have not been met. Chi-square analysis shows that age, education level, occupation, and monthly income significantly influence the willingness to pay a premium (p<0.01). The current market has not developed differentiated strategies for different consumer groups. The purchasing potential of high-end markets (high-income, highly educated individuals) has not been fully tapped, while middle-and low-income groups, due to their higher price sensitivity, have been marginalized, leading to limited market coverage.

Second, there is insufficient emotional trust and weak brand storytelling capabilities. Mediation effect tests show that the mediating role of emotional trust (effect size 0.452) is significantly stronger than that of cognitive trust (effect size 0.318), and "curiosity" and "endorsement from people around them" are key emotional triggers in consumer purchasing behavior. The marketing of zero-carbon agricultural products overly relies on rational promotion of their "environmental attributes" (such as carbon labels) and lacks emotional resonance design.

Third, the distribution of channels is imbalanced, with urban and rural markets being separated. The survey shows that 91.4% of non-purchasers believe there are "too few purchasing channels," and sales in markets outside the main urban areas (such as counties in reservoir regions) are growing slowly. Zero-carbon agricultural products are concentrated in high-end supermarkets like Hema, while the coverage of distribution channels in district, county, and rural markets is low. High logistics costs in mountainous areas further exacerbate the imbalance between urban and rural supply and demand, hindering market penetration.

Fourth, the high cost of certification and the sudden barriers to participation for small farmers. 73.08% of low-income consumers refuse to pay premiums due to price sensitivity, while the certification fee for a single product approximately 50,000 is yuan. The certification complex process is and time-consuming, and there is a lack of technical support for large-scale production, making it difficult for small farmers to bear the certification costs, leading to a single market supply entity.

## 4.2 Suggestions for Promoting the Development of Zero-Carbon Agricultural Products Market

## (1) Reasonable pricing

According to the survey results, 43% of respondents are willing to pay a premium for eco-friendly products, which means more than half of consumers are unwilling to spend extra money on zero-carbon agricultural products. Therefore, to promote the market development of zero-carbon agricultural products, producers and consumers need to negotiate reasonably, lower market prices, and increase the purchase volume of zero-carbon agricultural products. Buyers focus on price factors; currently, the supply of zero-carbon agricultural products in the market is limited, with fewer varieties and generally higher prices, and production technology standards are not well established. Therefore, to promote the market development of zero-carbon agricultural products, sales companies and logistics enterprises need to control the production costs of zero-carbon agricultural products, lower market prices, and increase purchase volume of zero-carbon the agricultural products, thereby meeting the purchasing needs of buyers.

## (2) Expand sales channels

Play the mediating role of cognitive trust. According to the survey questionnaire, zero-carbon agricultural products suffer from insufficient popularity and limited promotion. The higher consumers 'awareness of the food safety attributes of zero-carbon agricultural products, the more likely they are to develop cognitive trust, and the greater their willingness to pay a premium. Zero-carbon retail companies can actively utilize online advertising media or offline supermarkets and other channels for promotion. By continuously conveying information about the food safety of zero-carbon agricultural products to consumers, they can enhance consumers' perception that these products are safer and healthier, thereby fostering cognitive trust and increasing their willingness to purchase zero-carbon agricultural products.

(3) Strengthen national support policies

Increase policy support. First, formulate comprehensive preferential and subsidy policies. These mainly include ecological compensation, green subsidy policies, project fund support, tax reduction, tax exemption, interest subsidies, government grants, and other economic support measures. Multiple channels should be used to integrate and raise providing policy-based funds. financial support to production households and processing enterprises. Implement tax reductions and other preferential policies for enterprises, relevant processing reduce certification and testing fees for organic agricultural products. and encourage enterprises and buyers to participate in the production and purchase of green agricultural Through price support products. and agricultural subsidies, including subsidies for environmental protection investments and pollution reduction actions, enhance the operating income of zero-carbon agricultural products in green agricultural production. With national policy support, improve the ability of green agricultural producers to withstand risks and incentivize farmers to engage in green production practices.

(4) Change the concept of consumption

Emphasize the role of emotional trust in promoting the purchase of zero-carbon products. agricultural The ecological friendliness attribute of zero-carbon agricultural products indicates that they are environmentally friendly. Building consumer emotional trust further helps consumers make purchases of zero-carbon agricultural products. It is recommended that relevant departments focus on cultivating the ecological friendliness attribute of zero-carbon agricultural products and fostering an emotional resonance with consumers 'environmental awareness when

formulating promotional plans for these products. Emphasize the fundamental shift in consumer attitudes. To encourage people to protect nature and adopt scientific, civilized, and healthy consumption patterns to optimize the ecological environment, it is appropriate to guide changes in consumer attitudes and behaviors. As China's green production and consumption policies continue to accelerate, efforts should be made to guide consumers to improve their living standards and enhance environmental awareness, increasing attention to the quality and environmental friendliness of agricultural products.

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