



Research on Influencing Factors of Consumers' Satisfaction with Online Shopping of Fresh Agricultural Products

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Abstract. In recent years, fresh e-commerce has developed rapidly, but the intensification of industry competition has brought new challenges to fresh e-commerce enterprises. This research studies the influencing factors of consumers' satisfaction with online shopping of fresh agricultural products. The results show that pre-purchase expectation has a negative impact on consumer satisfaction. Perceived value, logistics distribution, reputation and after-sales service have a significant positive impact on consumer satisfaction, while online platform has no significant impact on consumer satisfaction. Finally, based on the research conclusions, this study puts forward some countermeasures and suggestions on improving customer satisfaction.

Keywords: Fresh e-commerce; Online shopping satisfaction; Structural equations

1 Introduction

With the development of economy and technology, the Internet has played an increasingly important role in people's daily life, changing the traditional way of shopping in the past and bringing great convenience to our life. At present, the number of Internet users and online shopping users in China continue to grow. The growth of online shopping users has driven the development of fresh e-commerce. In 2021, the market transaction volume of China's fresh e-commerce industry reached 465.81 billion yuan.

Under the background of good market environment and policy support, fresh e-commerce has developed rapidly in recent years. However, due to the characteristics of fresh agricultural products such as short shelf life and difficulty in storage, and the differences between traditional shopping and online shopping, fresh e-commerce enterprises have encountered some bottlenecks in the development process. On the other hand, with the continuous improvement of people's living standards, consumers' requirements for product and service quality are also constantly improved, which poses new challenges to fresh e-commerce.

Oliver (1980) thinks that consumer satisfaction is a kind of perception generated by comparing the actual performance level experienced by consumers with their pre-purchase expectations during the consumption of products or services. Consumer satisfaction reflects consumers' recognition of products, and is an index to judge whether consumers will make the next purchase. Zeithaml believes that consumer perceived value plays an important role in consumer satisfaction and loyalty. He believes that perceived value is the overall evaluation formed by consumers after weighing the perceived benefits and costs in the purchase process. Perceived value reflects consumers' subjective cognition of the value of products or services provided by enterprises, which is different from the objective value of products and services ^[1]. Therefore, analyzing consumers' satisfaction is of great help to understand their psychological evaluation and repurchase intention.

With the development of e-commerce, there are more and more researches on the influencing factors of online shopping customer satisfaction. For example, Jinxiang Cha (2006) combined the theory of expected uncertainty with the theory of service quality, and found that the service quality of websites and customers' expectations of websites jointly determine their satisfaction with shopping websites ^[2]. However, most of the existing related researches focus on the commodity categories with a high degree of standardization. At present, there are few researches on online shopping customer satisfaction of fresh agricultural products, and the research conclusion of general e-commerce online shopping may not be applicable; Secondly, in the measurement of consumers' satisfaction with online shopping, most of the domestic researches are expanded on the basis of drawing lessons from foreign consumer satisfaction index models, and it is difficult to put forward specific targeted measures from the microscopic aspect; In addition, different scholars have different research perspectives, thus there is still a lack of uniform standards in the identification and measurement of influencing factors of satisfaction. Therefore, starting from the decision-making process of consumers' purchase, this study analyzes the factors that may affect consumers' satisfaction in each link, seeks a general evaluation standard of consumers' satisfaction with online shopping of fresh agricultural products, and provides suggestions for the improvement and perfection of fresh e-commerce products and services, which has certain practical guiding significance for improving consumers' satisfaction and realizing sustainable operation.

2 Theoretical framework and hypotheses development

Combined with the current development situation of fresh e-commerce and the related theories of satisfaction research, this study further improves the existing model, divides the process of consumers' online shopping for fresh agricultural products into three stages: before, during and after purchase, and takes pre-purchase expectation, online platform, reputation, logistics distribution, perceived value and after-sales service as key influencing factors. Based on this, it analyzes the influence of each factor on consumers' online shopping satisfaction of fresh agricultural products and builds a theoretical model.

Based on this, this study puts forward the following hypotheses:

H1: Pre-purchase expectation has a significant negative impact on consumer satisfaction.

Pre-purchase expectation is that consumers predict the degree to which goods can meet their own needs before purchasing. According to the theory of expectation confirmation, consumers will compare their expectations before purchase with the actual situation of goods meeting the demand level, resulting in satisfactory judgment. Therefore, under the condition that the quality of products or services is certain, the higher consumers' psychological expectations of products are, the more difficult it is to be satisfied.

H2: The quality of online platform has a significant positive impact on consumer satisfaction.

Online platform is the window for merchants to communicate with consumers, so the functional design and security of online platform will affect consumers' shopping experience. Beautiful interface design will give people a good visual experience and attract consumers' attention. Reasonable functional layout can facilitate the shopping operation and reduce the time cost spent by consumers in searching.

H3: Reputation has a significant positive impact on consumer satisfaction.

Because of the virtual nature of online shopping, consumers can't directly contact the products. Therefore, the introduction of product information provided by merchants and the evaluation of consumers can have an important impact people's purchasing decisions. Consumers are more inclined to choose platforms with good reputation, and think that a good brand image can reduce the risk of uncertainty. Therefore, good reputation and the authenticity of comments will both affect consumers' satisfaction after purchase.

H4: Logistics distribution has a significant positive impact on consumer satisfaction.

Logistics service involves the timeliness of delivery, the rationality of delivery cost and the integrity of packaging. In addition, whether goods can be delivered at the promised time is also a concern of consumers. Due to the vulnerability and perishability of fresh agricultural products, higher requirements are put forward for the quality of logistics distribution, especially for distribution speed and cost.

H5: Perceived value has a significant positive impact on consumer satisfaction.

Perceived value is the subjective evaluation of the overall utility produced by consumers after comparing the perceived benefits of using products or enjoying services with the cost of purchasing. The core is the trade-off between perceived gains and perceived losses^[3]. Perceived benefits are all the benefits obtained in the purchase and use of products, including material benefits and spiritual benefits. Perceived profit and loss is the total cost paid by consumers when purchasing, including money cost, emotional cost, risk of purchase failure, etc. Perceived value can be regarded as a measure of consumers' purchase price/performance ratio. The higher the perceived value of consumers, the easier it is to feel satisfied.

H6: After-sales service has a significant positive impact on consumer satisfaction.

When there is no significant difference in price and quality of fresh agricultural products, good customer service quality becomes the key factor for fresh e-commerce to

enhance competitiveness, and improving after-sales service level also becomes an important means to improve consumer loyalty.

3 Measures

On the basis of previous studies, this study further determines the observation items combined with the characteristics of online shopping of fresh agricultural products by consumers in China. After analyzing the reliability and validity of the questionnaire through pre-investigation, the items are further improved and revised, and the final questionnaire is formed accordingly, as shown in Table 1.

Table 1. Scale Design

Variable	name	Measurement item	Reference
<i>Pre-purchase expectation</i>	A1	I predict that this platform will enable me to buy satisfactory fresh products.	Oliver (1980) ^[4]
	A2	I predict that the quality of online fresh products will meet my expectations.	Paraaman (1998) ^[5]
	A3	I predict that the delivery speed of the platform will meet my expectations.	
<i>Online platform</i>	B1	I think the online shopping platform has beautiful page design and clear functions.	Cha Jin Xiang, Lisheng Wang (2006) ^[2]
	B2	I think shopping on this platform is simple, convenient and easy to operate.	
	B3	I think the payment methods of this platform are diverse, safe and convenient.	
<i>Reputation</i>	C1	I value the reputation and reputation of the platform.	Koehen D (2003) ^[6]
	C2	The evaluation of goods influences my purchase decision.	Li Zheng (2008) ^[7]
	C3	Comments can truly reflect the situation of goods.	
	C4	I can get effective information from comments.	
<i>Logistics distribution</i>	D1	The products can be delivered at the promised time.	Cho, Park (2001) ^[8]
	D2	The product distribution cost is reasonable, and the distribution information can be queried in time.	
	D3	The received products are well packaged.	
	D4	I am satisfied with the logistics distribution.	
<i>Perceived value</i>	Z1	The quality and quantity of fresh products purchased are consistent with the website description.	Sweenny ^[9] (2002)
	Z2	I think the fresh products are very fresh and of good quality.	Yuhui Liu (2016) ^[10]
	Z3	Considering the quality of the products, I think the pricing is reasonable.	
	Z4	Considering the service, I think the purchase is cost-effective.	
<i>After-sales service</i>	F1	Have a good channel to reflect after-sales problems.	Fanjiao Chen (2016) ^[11]
	F2	Customer service can reply in time to solve problems.	
	F3	After-sales problems are handled satisfactorily.	
<i>Satisfaction</i>	M1	I am satisfied with the overall shopping experience.	Fanjiao Chen (2016) ^[11]
	M2	The shopping experience is in line with my expectations.	
	M3	I will continue to buy fresh products online.	

Surveys were conducted online and offline, and about 90% of them were obtained through online surveys. In the survey, 380 questionnaires were distributed and 365 were collected, of which 348 were valid, with an effective recovery rate of 95.3%.

4 Analysis

4.1 Reliability analysis and validity analysis

In this study, Cronbach's alpha coefficient method is used for reliability analysis. The analysis results are shown in Table 2. Cronbach's alpha coefficient of seven variables is above 0.7, and Cronbach's alpha coefficient of the overall scale is 0.862, which shows that the scale has good consistency and overall reliability.

Table 2. Reliability analysis results

Variable	Effective number of samples	quantity	Cronbach's Alpha
<i>Pre-purchase expectation</i>	348	3	0.824
<i>Online platform Reputation</i>	348	3	0.711
<i>Reputation</i>	348	4	0.811
<i>Logistics distribution</i>	348	4	0.766
<i>Perceived value</i>	348	4	0.764
<i>After-sales service Satisfaction</i>	348	3	0.764
<i>Satisfaction</i>	348	3	0.769
Overall	348	24	0.862

In this study, 24 items in the questionnaire were analyzed, and the results are shown in Table 3, in which KMO value is 0.862, and Sig. value of Barlett spherical test is 0.000, less than 0.01. After that, the maximum variance method is used to rotate the factor matrix, and the obtained coefficients are all higher than 0.5, which shows that the factors have high explanatory power.

4.2 Structural Equation Model Analysis

4.2.1 Model fitting test.

Next, the actual data obtained from the questionnaire survey are analyzed by Amos software, and the model fitness index obtained is shown in Table 3. It can be seen that the chi-square degree of freedom ratio is 1.199, which achieves good fitness; The values of IFI and CFI are all above 0.9, and GFI, AGFI, RMR and RMSEA have all reached the ideal fitting standard, so the fitting degree of the model is good.

Table 3. Structural equation model fitting index results

Index	χ^2/df	GFI	AGFI	RMR	RMSEA	NFI	IFI	CFI
Value	1.199	0.933	0.914	0.023	0.024	0.911	0.919	0.912

4.2.2 Hypothesis test.

This part analyzes the mechanism of each influencing factor of consumer satisfaction, and tests the six hypotheses put forward. The analysis results are shown in Table 4.

Table 4. Results of hypothesis testing

			Coefficient	P	Conclusion
Satisfaction	< ---	Pre-purchase expectation	-0.139	***	H1 supported
Satisfaction	< ---	Online platform	0.285	0.350	H2 not supported
Satisfaction	< ---	Reputation	0.381	***	H3 supported
Satisfaction	< ---	Logistics distribution	0.358	***	H4 supported
Satisfaction	< ---	Perceived value	0.476	***	H5 supported
Satisfaction	< ---	After-sales service	0.247	***	H6 supported

Note: *** $p < 0.001$, ** $p < 0.05$, * $p < 0.1$

According to the test results, pre-purchase expectation negatively affects consumer satisfaction ($\beta = -0.139$, $p < 0.001$), supporting the hypotheses H1. This is also consistent with the expectation theory. If the quality of fresh agricultural products is not as good as psychological expectations, it will reduce consumer satisfaction to a certain extent; The influence of online platform on consumer satisfaction is not significant ($\beta = 0.285$, $p > 0.05$), so H2 is not supported. The possible reason is that the design of each fresh e-commerce platform on its website platform is relatively perfect at present, and the corresponding functional layout, page design, choice of payment methods and correspondence of websites can basically meet the needs of consumers, and the differences between them are small, which makes the influence of this factor on consumer satisfaction weak; Word-of-mouth positively affects consumer satisfaction ($\beta = 0.381$, $p < 0.001$), supporting the hypotheses H3; Logistics has a positive impact on consumer satisfaction ($\beta = 0.358$, $p < 0.001$), supporting the hypotheses H4; Perceived value positively affects consumer satisfaction ($\beta = 0.476$, $p < 0.001$), supporting the hypotheses H5; After-sales service positively affects consumer satisfaction ($\beta = 0.247$, $p < 0.001$), supporting the hypotheses H6. Therefore, enterprises should reasonably guide consumers' purchase expectations, and improve consumers' satisfaction by strictly controlling product quality, establishing a good corporate image, improving logistics and after-sales service. Through the above measures, the unique brand advantages of enterprises can be formed to achieve long-term development.

5 Conclusion

This study mainly studies the satisfaction of consumers in online shopping for fresh agricultural products under the e-commerce mode. Based on the theories of inconsistent expectations and service quality, this study constructs a theoretical framework for the study of consumers' online shopping satisfaction for fresh agricultural products. Secondly, combined with the actual situation of online shopping of fresh agricultural products by Chinese consumers, the index system is determined and the research hypothesis

is put forward. After that, this study analyzes the obtained data, summarizes the influence of various factors on consumer satisfaction, and further provides suggestions for fresh e-commerce to improve consumer satisfaction.

In order to seek a universal conclusion, this study comprehensively considered a variety of fresh e-commerce operation modes, but did not analyze a specific platform. However, there are certain differences among various fresh e-commerce platforms, and consumers tend to have subjective preferences. Therefore, future research can further refine or select different types for comparative research. In addition, under the influence of " COVID-19", online shopping and contactless distribution have become hot words, and consumers have a new understanding of the convenience and safety of fresh e-commerce, which has also promoted the transformation of consumption patterns and the formation of consumption habits to a certain extent. Facing the change of environment, the influence of new measures of fresh e-commerce and the change of consumers' psychology on post-purchase satisfaction is also the direction of future research.

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