



Research Paper

## Research on Consumer Demand of Aquatic Products Prefabricated Vegetable Market

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**ABSTRACT:** The purpose of this paper is to investigate the consumer demand of the prefabricated vegetable market of aquatic products in Zhanjiang City, and to conduct an online questionnaire survey of the consumers of this case by means of multivariate ordered logistic regression. Through this paper, 14 variables were analyzed, including the understanding of the product, the promotion intensity, the advertising content, the number of publicity platforms, the number of promotions, the taste of the prefabricated dishes, the convenience and time-saving production, the brand awareness, and the good reputation of the enterprise. A total of 500 questionnaires were collected, and 465 valid questionnaires were collected, with an effective rate of 93%.

**KEYWORDS:** Prefabricated aquatic products; Consumer demand; Multivariate ordered logistic regression

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### I. INTRODUCTION

With the continuous acceleration of the pace of modern life, people's requirements for food are getting higher and higher, not only need to be convenient and fast, but also need to be healthy and nutritious. In this case, prefabricated dishes came into being and became an indispensable part of people's dietary life, and aquatic product prefabricated dishes (prefabricated dishes) as one of the important categories have also attracted more and more people's attention.

Aquatic products refer to marine and freshwater fishery aquaculture or fishing aquatic animal and plant products and their processed products, because of their unique flavor, high nutritional value, is a popular choice for making prefabricated vegetable raw materials. However, the development of its industry is still in its infancy, the research on aquatic product prefabricated dishes is very little and relatively scattered, compared with other kinds of prefabricated dishes, the problems in the aquatic product prefabricated food industry are significant, the regional differences in the origin of raw materials are obvious, the price is subject to seasonal fluctuations, and the production equipment and production technology requirements are higher.

Aquatic products prefabricated dishes began in United States, flourished in Japan, in the long-term development of leading enterprises through mergers and acquisitions of small enterprises to achieve expansion, to achieve the whole industry chain standardized management model. In contrast, although the number of prefabricated food enterprises in China is large, the number of large-scale enterprises is small, the lack of leading enterprises, the industry pattern is scattered, the market competition is fierce, the product production is unstable, and at the same time, the different eating habits at home and abroad also limit the development of China's prefabricated food.

The emergence of prefabricated dishes provides consumers with a richer choice, but also reduces the cost and human resource pressure of the catering industry Gradually rising. People pay more and more attention to food safety, people's demand for diversified catering changes, convenient, concise, nutritious, diverse have become people's requirements for catering, coupled with China's vigorous deepening of agricultural supply-side reform, market demand and government policies to promote the prefabricated dishes have become a hot spot.

According to the compilation instructions of the group standard "Aquatic Product Prefabricated Dishes" issued by the China Aquatic Products Circulation and Processing Association in September 2022, the

classification table of aquatic product prefabricated dishes was obtained (Foodmate, 2022) .

**Table 1 Classification of Prefabricated Aquatic Products**

Classify		Definition
How to eat	Ready-to-eat	After opening the bag, it can be eaten directly, and there is no need for further heat treatment
	i.e. hot class	Prepared dishes of aquatic products should be heated before eating
Storage and transportation methods	Ready-to-cook	With or without adjuncts, edible aquatic products are prepared dishes
	Storage and transportation at room temperature	Prepared aquatic products that can be transported and sold at room temperature
	Refrigerated storage and transportation	After rapid cooling, the aquatic products are stored, transported and sold under the condition of 0 °C ~ 10 °C
Processed raw materials	Frozen storage and transportation	After rapid freezing, it is stored at a temperature of -18 °C and below, and the prepared aquatic products are transported and sold at a temperature of -12 °C and below
	Animality	Prepared dishes made from fish, crustaceans, shellfish, cephalopods and other animal aquatic products and their products as the main raw materials
Processing method	Vegetative	Pre-made dishes made from aquatic plants such as algae and their products as the main raw materials
	Raw	It is a prefabricated dish that can be directly used for cooking by using aquatic products as raw materials and processed by pickling, drying, modulating, sizing and paste
	Cooked	Prepared dishes of aquatic products that have been cooked or sterilized to achieve edible doneness should be heated to the optimal serving temperature before eating

Reference: Foodmate, 2022

Zhanjiang is now the city's total aquatic output and total output value for 20 consecutive years ranked first in the province, with a total aquaculture area of 1.2 million mu and 3,500 deep-sea cages, accounting for about 70% of the total number of the province. Zhanjiang, which has the crown of "China's shrimp capital", ranks first in the seven indicators of shrimp seedling production, breeding area, aquaculture output, feed production, processing scale, export volume and transaction volume in all parts of the country, and has the reputation of "3 out of every 5 shrimps in the country come from Zhanjiang", and Zhanjiang is one of the largest golden pomfret breeding bases in the country, with an annual output of about 100,000 tons of golden pomfret Accounting for about 40% of the country, "one out of every three golden pomfret in the country comes from Zhanjiang".

As the first cabinet product of Guangdong prefabricated vegetables in 2022, Zhanjiang golden pomfret has performed well in the prefabricated vegetable track and has become the star product of Zhanjiang aquatic product export. In October 2021, Zhanjiang was officially awarded the title of "Golden Pomfret Capital of China" by the China Aquatic Products Circulation and Processing Association. After years of exploration, innovation and development, the aquatic product industry has become the most distinctive, the most competitive, the most promising for development, the block economy and industrial cluster with a complete industrial chain in Zhanjiang City, and the government is vigorously building Zhanjiang International Aquatic City and Wuchuan, Suixi Prefabricated Vegetable Industrial Park, and launching more high-quality marine ranch prefabricated vegetable products.

This study provides a comprehensive analysis of the demand of consumers of prefabricated aquatic products in Zhanjiang City, aiming to:

(1) This paper focuses on the analysis of the specific impact of the commodity attributes (including taste, hygiene, price, freshness and convenience of ingredients) on consumers' purchase intentions, in order to provide more practical and feasible suggestions for the sales and publicity strategies of aquatic prefabricated dishes, so as to better meet the psychological needs of consumers and effectively stimulate their desire to buy.

(2) Starting from the five key dimensions of corporate brand awareness, word of mouth, after-sales service, sales channels and business areas, this paper deeply explores the impact of these factors on consumers' online and offline purchase of aquatic products prefabricated dishes, aiming to provide merchants with more targeted online and offline sales strategy optimization suggestions, so as to improve consumers' shopping experience and purchase intention, and further expand the aquatic products prefabricated vegetable market.

## II. LITERATURE REVIEW

In China, a number of studies have been carried out on prefabricated aquatic products, especially for the market consumption needs of specific regions. Dai Jingjing et al. (2024) put forward their thoughts on the future development of the aquatic product prefabricated vegetable industry by discussing the development status of the aquatic product prefabricated vegetable industry in Xinghua City, which provides an important reference for understanding the overall development trend of the aquatic product prefabricated vegetable industry. Li Rui and Guo Dongpeng (2023) focused on the development of Shantou's aquatic product prefabricated vegetable industry under the background of rural revitalization strategy, and their research not only revealed the development status of aquatic product prefabricated food in the region, but also put forward corresponding development countermeasures, which provided useful ideas for the revitalization of rural aquatic product prefabricated vegetable industry. Zeng Lingzhi (2023) provides a valuable perspective for understanding the aquatic product market, especially the aquatic product market in Zhanjiang City, by analyzing the influencing factors of the export competitiveness of aquatic products in Zhanjiang City, which also indirectly reflects the market demand and consumption potential of prefabricated aquatic products in Zhanjiang City. Wang Jiayi (2023) pointed out that aquatic prefabricated dishes have performed well in the field of prefabricated dishes and become "excellent students", which reveals the superior position of aquatic prefabricated dishes in the market and the favor of consumers. Huang et al. (2023) describe in detail the development status of the aquatic product prefabricated vegetable industry, which provides important data for industry research, and these data also provide a macro background for understanding the consumption demand of the aquatic product prefabricated vegetable market in Zhanjiang City. Jiao Yue and Wang Jingru (2022) observed that although the concept of prefabricated dishes received attention as the year approached, consumers still held a wait-and-see attitude, which revealed consumers' cautious attitude towards prefabricated dishes, including aquatic products, and provided a level of consumer psychology for understanding market consumer demand.

In foreign countries, there are also a number of studies worthy of attention for the market consumption demand of prefabricated dishes, including aquatic products. Xiong Y et al. (2023) analyzed the willingness of Chinese residents to consume prefabricated dishes, providing a theoretical framework for understanding the deep-seated reasons for the consumption behavior of prefabricated dishes. Neha S et al. (2024) studied which retail strategy can meet consumers' demand for shelf-life products under the game policy, and their findings provide useful insights for the retail strategies of shelf-life products such as prefabricated dishes, which also provide a reference for the retail strategies of prefabricated aquatic products in Zhanjiang in the international market. Dinah P A D et al. (2022) discussed the main factors influencing consumers' perception and attitude towards the quality of meat and processed meat products, and their research, although it is aimed at meat products, provides an analogy for understanding consumers' perception of the quality of aquatic prefabricated dishes, which is helpful to understand the quality requirements and expectations of foreign consumers for aquatic prefabricated dishes. Xin S et al. (2022) investigated the factors influencing Chinese consumers' willingness to purchase cold-chain aquatic products under the COVID-19 epidemic, revealing the changes in consumer behavior during the epidemic, and this finding also provides an analogy for understanding the market demand and consumption behavior of foreign consumers for prefabricated aquatic products in special periods such as similar epidemics. Yunyun D et al. (2021) studied the influencing factors of Chinese consumers' attitudes towards aquatic product safety, and their findings not only provide an important perspective for consumers' trust and safety perception in the Chinese aquatic product market, but also provide a valuable reference for understanding the safety requirements and trust of foreign consumers in the aquatic product prefabricated vegetable market.

## III. MATERIALS AND METHODS

### 3.1 Respondents

This study surveyed the consumers of prefabricated aquatic products in Zhanjiang City, Guangdong Province. A multi-stage sampling method was adopted, and in the first stage, stratified sampling was carried out based on the Zhanjiang Municipal Bureau of Statistics (2023): Zhanjiang Population Census Data Proportion. In the second stage, a certain number of people who purchased prefabricated aquatic products were randomly selected from the corresponding cities through stratified sampling. In order to ensure the randomness of the selection, the subjectivity and purpose are excluded, and each respondent is guaranteed to have the same probability of being selected (see Table 2 for details).

### 3.2 Questionnaires

In order to obtain a sufficient number of samples, the ratio of question type to sample size was 1:15, and the sample size of this paper was determined to be 465 samples. In order to obtain a sufficient number of samples, the ratio of question type to sample size is 1:15, and the sample size of this paper is determined to be 465 samples. As shown in Table 2. After the questionnaire was designed on the questionnaire network platform,

the reliability and validity analysis was carried out through the preliminary pre-survey, and the final questionnaire was finally modified after group discussion, and the final questionnaire was obtained, and the corresponding proportion of questionnaires were placed online in Zhanjiang City to the prefabricated food consumers in each region.

**Table 2 Questionnaire Scale**

Region	Population/10,000 people	Questionnaires delivered	Specific gravity
Chikan District	40.41	26	5.59%
Xiashan District	54.82	37	7.68%
Potou District	34.38	22	4.84%
Mazhang District	33.80	20	4.67%
Economic Zone	35.64	23	4.88%
Suixi County	83.17	55	11.81%
Xuwen County	664.17	42	9.07%
Lianjiang County	137.19	91	19.53%
Leizhou City	132.59	88	18.92%
Wuchuan City	91.68	61	13.00%

Reference: Zhanjiang Municipal Bureau of Statistics (2023).

#### IV. PURCHASE FREQUENCY PREDICTION AND INDEPENDENT VARIABLE ANALYSIS

There are three main steps to data modeling in this study.

First, all variables are screened by univariate analysis to determine which variables are important to the dependent variable and which are not. Secondly, the independent variables that are important to the dependent variable are selected for multivariate analysis to determine which independent variables have independent effects on the dependent variable. Finally, the obtained independent variables will be diagnosed with multicollinearity and screened out, and the variables with multicollinearity will be modeled by logistic regression analysis to determine which independent variables have significant predictive power for the dependent variables, and whether their influence on the dependent variables is positively or negatively correlated.

##### 4.1 Univariate analysis

###### 4.1.1 Analysis steps

(1) The quantitative variable (Y) is grouped according to the qualitative variable (X), and its normality test is tested separately to see whether the overall distribution of the data presents a normal distribution, and if the test fails, the normality test is used for further analysis.

(2) The quantitative variable (Y) was grouped according to the qualitative variable (X), and the homogeneity test of variance was performed to see if the P value was less than 0.05, and if the P value was greater than 0.05, the analysis of variance was used to see whether the P value was significant ( $P < 0.05$ ).

(3) If there is significance, the difference can be analyzed according to the means  $\pm$  standard deviation, otherwise it shows that the difference is not presented.

The univariate normal test table 3 shows the quantitative variables age (X1), education (X2), income (X3), understanding (X4), and high product promotion (X5), product advertising content (X6), product promotion platforms (X7), product promotion times (X8), prefabricated dish taste (X9), good hygiene conditions (X10), fresh ingredients (X11), convenient and time-saving (X12), low price (X13), brand awareness of prefabricated food enterprises (X14), good reputation of prefabricated food enterprises (The results of 18 descriptive statistics and normality tests, including median and average, were obtained from 18 descriptive statistics and normality tests, including median and average, such as X15), perfect after-sales service of prefabricated vegetable enterprises (X16), multiple product sales channels of prefabricated vegetable enterprises (X17), and wide business area of prefabricated vegetable enterprises (X18). to test the normality of the data.

In general, there are two methods for normal distribution: one is the Shapiro-Wilk test, which is suitable for small sample data (sample size  $\leq 5000$ ); The other is the Kolmogorov-Smirnov test, which is suitable for large samples (sample size  $> 5000$ ), if there is significance ( $P < 0.05$ ), it means that the null hypothesis is rejected (the data conforms to the normal distribution), the data does not satisfy the normal distribution, and vice versa, the data satisfies the normal distribution. Since the sample size in this paper is less than 5,000, the Shapiro-Wilk test is used for the normal distribution test.

**Table 3 Univariate Normal Test**

Variable	Median	Average value	Standard deviation	Skewness	Kurtosis	S-W test	K-S test
X1	1	1.994	1.107	0.376	1.523	0.728(***)	0.349(***)
X2	2	2.105	0.804	1.382	2.696	0.72(***)	0.391(***)
X3	4	3.08	1.293	0.395	1.147	0.856(***)	0.274(***)
X4	1	1.48	0.757	1.191	0.211	0.632(***)	0.418(***)
X5	3	3.054	1.046	0.426	0.598	0.88(***)	0.232(***)
X6	2	2.535	1.025	0.362	-0.28	0.9(***)	0.205(***)
X7	2	2.495	1.393	0.237	-1.5	0.822(***)	0.235(***)
X8	3	2.785	0.988	0.199	-1	0.863(***)	0.262(***)
X9	3	2.905	1.04	0.179	0.892	0.892(***)	0.198(***)
X10	2	2.351	0.963	0.488	0.25	0.872(***)	0.206(***)
X11	3	2.471	1.349	0.184	1.311	0.825(***)	0.269(***)
X12	2	2.09	1.075	0.603	0.481	0.838(***)	0.243(***)
X13	2	2.305	1.053	0.443	0.404	0.882(***)	0.188(***)
X14	2	2.561	1.091	0.107	1.258	0.86(***)	0.236(***)
X15	2	2.366	0.949	0.139	-0.51	0.88(***)	0.223(***)
X16	3	2.697	0.965	0.104	0.944	0.875(***)	0.242(***)
X17	3	3.361	1.07	0.081	0.991	0.894(***)	0.209(***)
X18	4	3.305	1.419	0.083	1.575	0.822(***)	0.266(***)

Note: The sample size is 465. , \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively

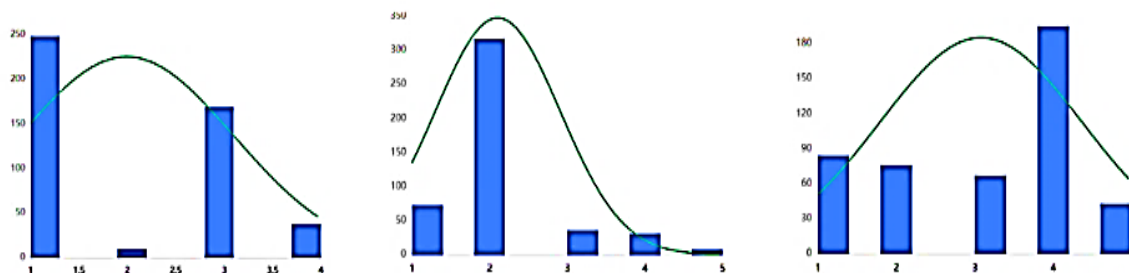
Conclusions: For the X1-X18 analysis items, Shapiro-Wilk was used to test the normality of the data. The results showed that the P value of all samples was 0.000\*\*\*, indicating that the data did not meet the normal distribution, the absolute value of kurtosis was less than 10, and the absolute value of skewness was less than 3.

**4.1.2 Normality Test**

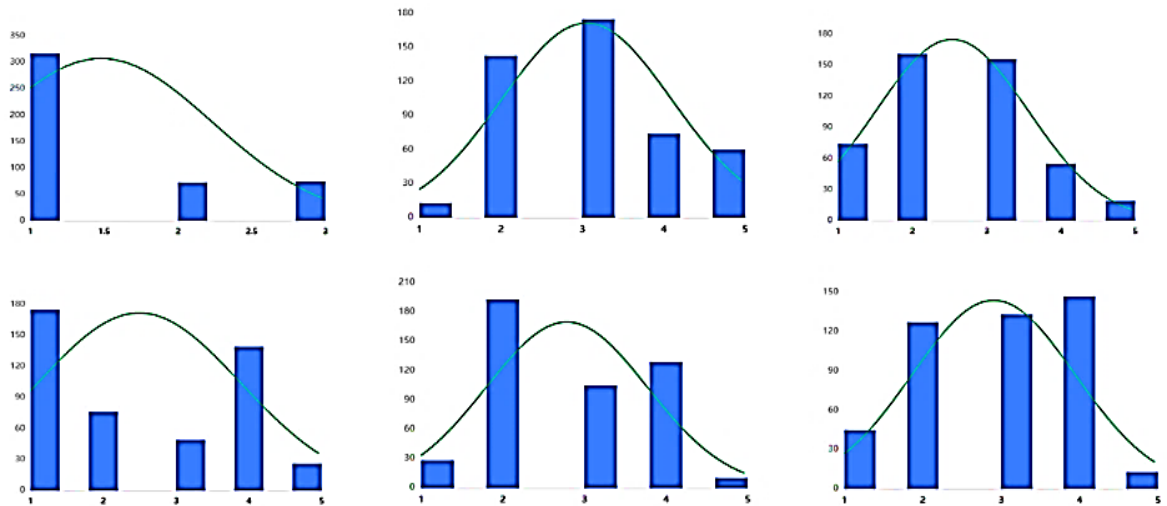
The Shapiro–Wilk test is one of the most effective methods for testing normality, which is a method to test normality in frequency statistics.

The graph method is characterized by intuitiveness, by observing the difference between the morphology and normal distribution of graphic elements such as points, lines, and bars, it can briefly and quickly judge whether (approximately) obeys the normal distribution, and this study intuitively shows the normality test of 18 factors through graphs.

The results of the normality test of the normal test of the normal test of the normal test of the quantitative variables age, education, income, understanding, product promotion intensity, product advertising content, product promotion platform, product promotion number and prefabricated dish taste data are respectively displayed, and the normal diagram basically presents a bell shape (high in the middle and low at both ends), indicating that although the data is not absolutely normal, it is basically acceptable to be a normal distribution. As shown in Figure 1(1-9 Diagrams).



**Figures 1 Normal Test 1-9 Diagrams**



Figures 2 Normal Test 1-9 Diagrams (continue)

Figures 2 (10-18 Diagrams) of the normal test show the results of the normality test of the quantitative variables with good hygienic conditions, fresh ingredients, convenient and time-saving production, low price, brand awareness of prefabricated food enterprises, good reputation of prefabricated food enterprises, perfect after-sales service of prefabricated food enterprises, multiple product sales channels of prefabricated food enterprises and wide business areas of prefabricated food enterprises. However, it is generally accepted as a normal distribution.

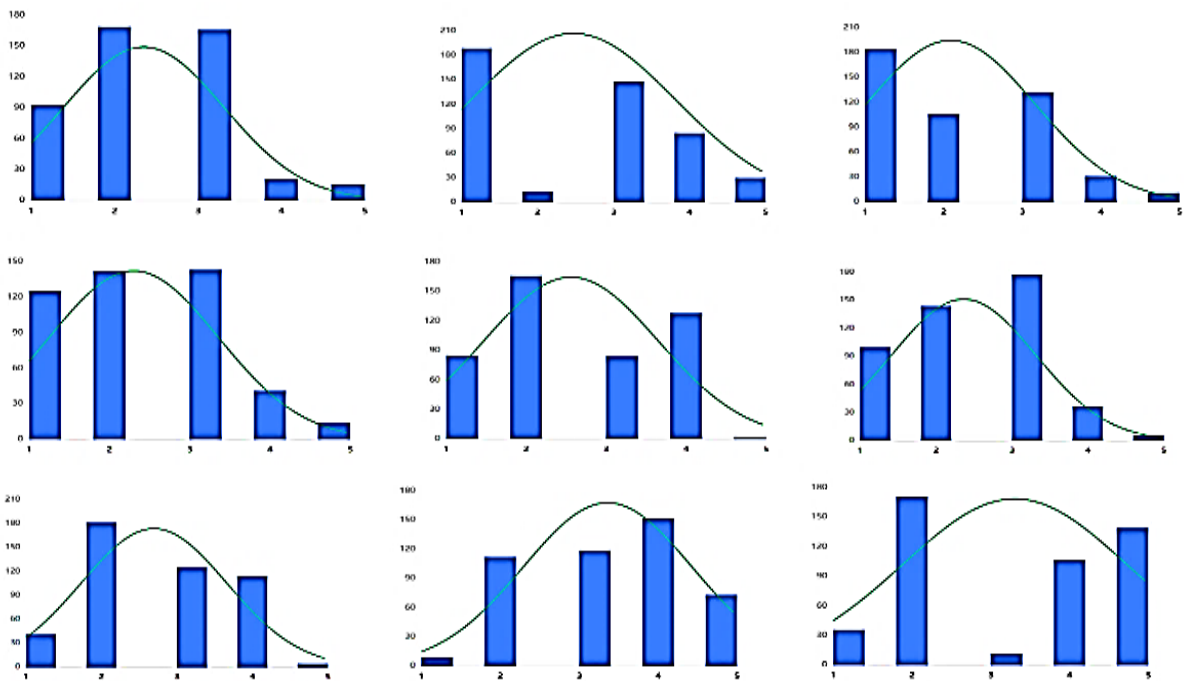


Figure 2 Diagram 10-18 of the Normal Test

#### 4.1.4 Summary

Among the 18 independent variables, the variance homogeneity test showed that the independent variables that had a significant impact on the purchase factors were education, income, understanding, product promotion, product advertising content, and product promotion platforms. There are many product promotions, the taste of prefabricated dishes, convenient and time-saving production, the brand awareness of prefabricated food enterprises, and the good reputation of prefabricated food enterprises. There are 14 variables such as perfect after-sales service of prefabricated food enterprises, many product sales channels of prefabricated food enterprises, and wide business areas of prefabricated food enterprises.

#### 4.2 Multivariate Analysis

The F-test results and significance P values of the 14 factors were determined by multivariate analysis of the results of multivariate ANOVA results (Table 4).

**Table 4 Results of Multivariate ANOVA**

Item	Sum of squares	Degree of freedom	Mean \square	F	P	R <sup>2</sup>	Adjust R <sup>2</sup>
Intercept	109.92	1	109.92	145.378	0.000***		
X2	5.057	4	1.264	1.672	0.000***		
X3	2.044	4	0.511	0.676	0.609		
X4	14.008	2	7.004	9.263	0.000***		
X5	4.961	4	1.24	1.64	0.163		
X6	18.763	4	4.691	6.204	0.000***		
X7	4.725	4	1.181	1.562	0.184		
X8	10.289	4	2.572	3.402	0.009***	0.728	0.653
X9	10.959	4	2.74	3.624	0.006***		
X12	17.293	4	4.323	5.718	0.000***		
X14	8.661	4	2.165	2.864	0.023**		
X15	7.233	4	1.808	2.391	0.050*		
X16	7.577	4	1.894	2.505	0.042**		
X17	3.124	4	0.781	1.033	0.39		
X18	12.108	4	3.027	4.003	0.003***		
error	310.001	410	0.756		In		

Education (P=0.000\*\*\*), understanding (P=0.000\*\*\*), product advertising content (P=0.000\*\*\*), prefabricated dish taste (P=0.006\*\*\*), product promotion times (P=0.009\*\*\*), convenient and time-saving production (P=0.000\*\*\*), wide business area of prefabricated food enterprises (P=0.003\*\*\*), perfect after-sales service of prefabricated food enterprises (P=0.042\*\*) and brand awareness of prefabricated food enterprises (P=0.023\*\*) has a significant positive impact on the purchase frequency, and there is a main effect.

Revenue (P=0.609), high product promotion efforts (P=0.163), multiple product promotion platforms (P=0.184) and multiple product sales channels of prefabricated food enterprises (P=0.390) had no significant impact on purchase frequency, and there was no main effect.

The good reputation of prefabricated food enterprises (P=0.050\*) was close to the significant level, but the impact on the purchase frequency was not significant, and there was no main effect.

#### 4.2.2 Summary

The impact on the purchase frequency is independent of nine independent variables: education, degree of understanding, product advertising content, prefabricated dish taste, product promotion times, convenient production and time-saving, wide business area of prefabricated food enterprises, perfect after-sales service of prefabricated food enterprises, and brand awareness of prefabricated food enterprises.

#### 4.3 Multicollinearity Test

Multicollinearity refers to the fact that the explanatory variables in the linear regression model are distorted or difficult to estimate accurately due to the existence of precise or high correlation between the explanatory variables. The variance expansion coefficient is an important discriminant index for judging multicollinearity between independent variables in this study. In order to test whether the model has multicollinearity, this study can check the size of the VIF, usually 10 is used as the judgment boundary, when the VIF is < 10, there is no multicollinearity; When 10<=VIF<100, there is a strong multicollinearity; When VIF>=100, the model has severe multicollinearity.

As shown in Table 5, it can be seen from the multicollinearity test results that the VIF of the nine independent variables is less than 10, which indicates that there is no multicollinearity between the nine independent variables, including education, understanding, product advertising content, prefabricated dish taste, product promotion times, convenient and time-saving production, wide business area of prefabricated food enterprises, perfect after-sales service of prefabricated food enterprises, and brand awareness of prefabricated food enterprises.

**Table 5 Multicollinearity Test**

	Factors not normalized B	Standard error	Normalization actor beta	t	Significance	Colinearity statistics	
						Tolerance	Bright
(Constant).	2.478	0.279		8.879	0.000		
X2	0.084	0.060	0.063	1.412	0.159	0.940	1.064
X4	-0.194	0.062	-0.136	-3.124	0.002	0.972	1.029
X6	-0.158	0.046	-0.150	-3.408	0.001	0.961	1.041
X8	-0.022	0.052	-0.021	-0.432	0.666	0.817	1.223
X9	0.021	0.047	0.020	0.447	0.655	0.888	1.126
X12	-0.195	0.045	-0.194	-4.312	0.000	0.914	1.094
X14	0.134	0.047	0.136	2.842	0.005	0.813	1.229
X16	0.134	0.053	0.120	2.527	0.012	0.826	1.211
X18	0.093	0.037	0.122	2.519	0.012	0.784	1.276

Among the independent variables, the relationship between the degree of understanding, the content of commodity advertising, the convenience and time saving of production, the brand awareness of prefabricated food enterprises, the improvement of after-sales service of prefabricated food enterprises, and the wide business area of prefabricated food enterprises and the dependent variables were statistically significant.

There was no statistically significant relationship between educational background, number of product promotions, and taste of pre-made dishes and dependent variables.

**4.4 Ordinal logistic Regression Model**

By utilizing an ordinal logistic regression model to determine which independent variables have significant predictive power for the dependent variable and whether their effect on the dependent variable is positively or negatively correlated.

**4.4.1 Analysis Steps of Ordinal Logistic Regression Model**

(1) Describe the distribution of categorical dependent variables.

(2) The likelihood chi-square test is performed on the model to analyze the likelihood chi-square significance, and the null hypothesis is that all the regression coefficients of the model are 0, so if the P value is less than 0.05, it means that the null hypothesis is rejected, that is, the model is valid, and if the P value is greater than 0.05, it means that the null hypothesis is accepted, that is, the regression coefficients of the model should all be 0, and the model is meaningless AIC and BIC values are used for comparison across multiple analyses; The lower the two values, the better; If the analysis is carried out several times, the changes of these two values can be compared to illustrate the optimization process of model construction. If (P<0.05), the model is valid, otherwise the model is not valid.

(3) According to the model parameter table, the significance of X was analyzed (P<0.05) to explore the influence of X on Y. The regression coefficient B and the OR value (odds ratio) were analyzed, and the influence of X on Y was compared and analyzed.

The model evaluation table shows the analysis results of the model. See Table 6.

**Table 6 Model Evaluation**

Likelihood is more chi-square	P	AIC	BIC
78.683	0.000***	1130.618	1180.322

Note: , \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively

The likelihood chi-square ratio is 78.683, which means that the model can explain more variance than the empty model (i.e., only the intercept term). The significance p is 0.000, which indicates that at least one independent variable in the model has a significant effect on the dependent variable, which further indicates that the model fits well. The AIC and BIC were 1130.618 and 1180.332, respectively, and the AIC and BIC values of the model were smaller, indicating that the model was relatively good at interpreting the data.

Therefore, according to the statistical indicators given, it can be concluded that the ordinal logistic regression model has a good effect and can effectively explain the variability of the dependent variables. According to ordinal logistic regression analysis: There was no significant effect on the purchase frequency of educational background X2 (P=0.071), the number of product promotions X8 (P=0.616) and the taste of prefabricated dishes X9 (P=0.562).



Degree of understanding **X4**(P=0.005, OR=0.719), product advertising content **X6**(P=0.001, OR=0.749), convenient and time-saving production **X12** (P=0.000, OR=0.702), brand awareness **X14**(P=0.005, OR=1.284), perfect after-sales service **X16**(P=0.016, OR=1.269), prefabricated food enterprises have a wide business area **X18**(P=0.016, OR=1.181) had a significant positive or negative impact on the purchase frequency, which was manifested in the fact that the probability of increasing the purchase frequency was reduced by about 28.1% and 25.1% respectively due to the increase of understanding and advertising content, while the probability of increasing the purchase frequency was increased by about 29.8%, 28.4%, 26.9% and 18.1% respectively due to convenience and time-saving, brand awareness, perfect after-sales service and wide business area (Table 7).

**Table 7 Ordinal Logistic Regression Results**

Item	Regression coefficients	Standard error	With	P	OR	Confidence interval	
						Upper limit	Lower limit
X2	0.217	0.121	1.803	0.071*	1.243	0.981	1.574
X4	-0.33	0.117	-2.812	0.005***	0.719	0.571	0.905
X6	0.288	0.086	1.353	0.001***	1.749	1.233	1.887
X8	-0.048	0.095	-0.502	0.616	0.953	0.791	1.149
X9	0.053	0.091	0.579	0.562	1.054	0.881	1.261
X12	0.354	0.086	1.119	0.000***	1.702	0.993	1.731
X14	0.25	0.088	2.838	0.005***	1.284	1.081	1.527
X16	0.238	0.098	2.42	0.016**	1.269	1.046	1.539
X18	0.167	0.069	2.407	0.016**	1.181	1.031	1.353

Note: , \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively

#### 4.4.2 Summary

(1) Education **X2** (regression coefficient is 0.217): It may be because well-educated people are more likely to buy pre-made dishes because they know better that pre-made dishes are not as unhealthy as they think.

(2) Degree of understanding **X4** (regression coefficient of -0.33): It may be because people with higher understanding are more likely to be aware of the shortcomings of prefabricated dishes, such as over-processing, insufficient nutrition, etc., so they are more reluctant to buy.

(3) Product advertising content **X6** (regression coefficient of 0.288): If the content of product advertising can attract people, then consumers are more likely to buy pre-made dishes.

(4) Convenient and time-saving **X12** (regression coefficient is 0.354): It may be because modern people are busy and are more willing to buy prefabricated dishes that are convenient and time-saving.

(5) Brand awareness of prefabricated food enterprises **X14** (regression coefficient is 0.25): It may be because consumers are more willing to buy well-known brands, and these brands usually invest more financial resources and time to improve the quality and reputation of products.

(6) Perfect after-sales service of prefabricated food enterprises **X16** (regression coefficient is 0.238): It may be because prefabricated food enterprises provide good after-sales service, and consumers trust these enterprises more, so they are more willing to buy their products.

(7) The business area of prefabricated food enterprises is wide **X18** (regression coefficient is 0.167): it may be because consumers are more inclined to choose well-known prefabricated food enterprises, and these enterprises usually operate in a broader area.

## V. CONCLUSION

The business coverage, precise grasp of consumer preferences and the choice of promotion methods are becoming more and more important in today's increasingly fierce market competition.

### 5.1 Improve Product Quality

**Improve the quality inspection mechanism:** In recent years, the scale of China's prefabricated food industry has expanded rapidly, and the prefabricated food industry currently lacks unified supervision and management standards. The quality standards of prefabricated dishes still rely on the independent testing of enterprises. Product quality is an important criterion to measure the reputation of an enterprise, and it also determines the rise and fall of an enterprise. There are many production processes of aquatic prefabricated vegetables, improve the quality inspection mechanism, and set up quality inspection agencies at the exit of the production line in each link to screen out unqualified products and no longer enter the production line. The reason should be indicated after each screening of unqualified products to prevent the problem of the same

situation next time. After the final aquatic prefabricated vegetable product comes out, the final finished product should be sampled and inspected to ensure that the quality of the final aquatic prefabricated vegetable members is qualified.

**Establish a fine product traceability code:** With the increase of national income and richer material culture, people's requirements for food hygiene and safety are increasing. In addition, in the context of the outbreak of the new crown epidemic, people are also paying more attention to the process of production, packaging and logistics of cold chain food. Establish a fine product traceability code, and store the detailed and fine relevant information of each link of each aquatic product, such as the place of purchase, handling personnel, and production machine number, in the product traceability code. Consumers can learn the details of each product by scanning the product traceability code, from the final sales location of each aquatic product to the feeding materials of each aquatic product. The traceability code of aquatic prefabricated dishes is detailed and fine, so that consumers can see the life of the raw materials of each aquatic prefabricated dish from "birth" to "table".

**Strictly control the standardization of product processing process:** each aquatic product should formulate corresponding food hygiene standards and product qualification standards and unified, standard production mode before production. The standards set should be in line with national and local standards. After formulating the standard, we should make full preparations, make reasonable distribution of the workload, material distribution and other processes, and carry out large-scale breeding and processing according to the standardized production model.

## 5.2 Extend the Product Line

Increase sales by expanding your product line or offering more options to meet more customer needs. For a brand, an appropriate product extension strategy needs to rigorously evaluate its true cost, both based on immediate economic considerations and the long-term impact on brand equity.

The managers of a successful brand must have a clear understanding of the core equity elements of the brand, and if each product line extension enhances the brand's equity, those opportunities to increase product loyalty will also be greater. When an enterprise develops to a certain scale and a more mature stage, it wants to continue to grow stronger and bigger, seize more market share, or to prevent and counterattack competitors, it often adopts product extension strategy, using consumers' recognition and recognition of existing brands, and launching sub-brands or new products, in order to make quick profits and quickly occupy the market through a shorter time and lower risk.

## 5.3 Pay Attention to the Consumption Scenario

According to the survey results, consumption scenarios such as banquets, early tasting, short meal preparation time, and gift giving have a great impact on consumers' purchase of prefabricated aquatic products, which can be used as an important entry point for marketing promotion. For example, in most areas of western Guangdong, large-scale banquets will be held on important occasions such as weddings and birthdays, and the consumption scenarios are more diverse.

## REFERENCES

- [1]. Dai J, Wang Z, Wu Y. Scientific fish farming, 2024(02):1-2. DOI:10.14184/j.cnki.issn1004-843x.2024.02.015.
- [2]. Dinah PAD, Coelho M W A , Luís P , et al. Understanding the main factors that influence consumer quality perception and attitude towards meat and processed meat products. *Meat Science*,2022,193108952-108952.
- [3]. Foodmate. Quality management specification for pre made aquatic products (preparation instructions) 2022. Food Partner Network Download Center 2024.08.18: foodmate.net
- [4]. Huang Y, Liang Y, Lu Y, et al. *Modern Food Science and Technology*, 2023,39(02):81-87. DOI:10.13982/j.mfst.1673-9078.2023.2.1040.
- [5]. Jiao Y, Wang J. The concept of prefabricated dishes is about to break out at the end of the year, and consumers are wait-and-see and do not buy it. *Public Investment Guide*,2022,(02):31.
- [6]. Li R, Guo D. Research on the development status and countermeasures of Shantou aquatic product prefabricated vegetable industry under the background of rural revitalization strategy. *Rural Economy and Science and Technology*, 2023,34(20):99-102.)
- [7]. Neha S, Mitali S, Biswajit S. Which retail strategy for shelf life products can satisfy consumers under game policy?. *Journal of Retailing and Consumer Services*,2024,76
- [8]. Wang J. *Agricultural Products Market*, 2023(05):26-27.)
- [9]. Xin S, Xun C, Sadeghian S E, et al. Factors influencing consumers' purchase intention on cold chain aquatic products under COVID-19: An investigation in China. *International Journal of Environmental Research and Public Health*,2022,19(8):4903-4903.
- [10]. Xiong Y, Lin X, Wen X, et al. The analysis of residents' intention to consume pre-made dishes in china: a grounded theory. *Foods*,2023,12(20):
- [11]. Yunyun D, Yong M Y ,Yuan Y , et al. Factors influencing Chinese consumer attitudes on the safety of aquatic products. *Journal of the World Aquaculture Society*,2021,53(1):47-59.
- [12]. Zeng L. Research on the influencing factors of export competitiveness of aquatic products in Zhanjiang City. *Guangdong Ocean University*, 2023. DOI:10.27788/d.cnki.ggdhy.2023.000320.
- [13]. Zhanjiang Municipal Bureau of Statistics. 2023 Zhanjiang national economic and social development statistical bulletin. 2023. 2024-04-02 23:32:20 : zhanjiang.gov.cn