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Research on the Factors Affecting Consumer Purchase Behavior of Green Agricultural Products

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***Abstract*—The Green agricultural product is not only conducive to the safety of people's lives, but also to achieve sustainable development of China's agriculture. It is necessary and urgent to study factors influencing consumer purchase behavior on green agricultural products. This paper invited 110 respondents from Wuhan, China to participate in this experiment to investigate their knowledge and perceptions about green agricultural products, and whether marketing elements will affect their purchase behavior. Then collected data is carried on cross analysis and regression analysis by using SPSS 19.0 software. The experimental results show that: gender, age, region, income and occupation have significant differences in purchase behavior. Consumers' green awareness, convenience of channel and product brand awareness positively affect the consumer's purchasing behavior while price has negative one. Finally we point out that the agricultural products the enterprise can use the price, channel and brand marketing strategies to stimulate consumers' green consumption.**

Keywords—Green Agricultural Products, Purchase Behavior, Marketing Strategy, Brand Marketing

I. INTRODUCTION

With the social development and the improvement of people's living standards, consumers are gradually paying more and more attention to the issue of food safety and environmental protection. And the consumption of green agricultural products (in this paper we entitle them green agricultural products (GAPs)) has gradually become a mainstream. According to statistics from China Green Food Development Center, the national output of green food in 2016 was 106,108,000 tons, but only accounted for 4.3% of the market share of food commodities, which could no longer satisfy the rapidly growing market demand. The market demand for green agricultural products has been rapidly increasing. However, there are many problems: the concept of green consumer consumption is immature; consumers have not yet fully formed the habit and strong awareness of consuming green agricultural products. Good green agricultural products are not branded resulting in green agricultural products in the sales channels and other links out of chains. To study the behavior of consumers in purchasing green agricultural products is mainly to enrich the theoretical research of related green agricultural products consumption for one aspect, and to understand the consumer's awareness of green agricultural products for another aspect. Based on this research, we can provide some suggestions targeted for agricultural enterprises making them manage their green marketing strategy.

II. LITERATURE REVIEW

Green agricultural products refer to those agricultural products that comply with the principle of sustainable development, which are produced in a special way under special circumstances and have been identified by the specialized agencies and promised to use green food signs, pollution-free, good-quality and nutritious. At present, the consumption of green agricultural products in developed countries is quite common (Braimah, 2015) [1].To promote the marketing on GAPs is of great significance to the entire world. The consumption of GAPs can not only help enhance the competitiveness of agriculture enterprise but also contribute to the environment.

The factors influencing green products purchase intention and behavior have been explored widely, including external and internal factors (Joshi and Rahman, 2015; Genovait and Jurga, 2017) [2-3]. Genovaitė and Jurga(2017) referred to that consumers' environmental concern (attitude, values), green consciousness, GAPs knowledge, perceived consumer effectiveness, attitude towards GAPs, price, eco-labeling (brand), accessibility and convenience are the determinants of GAPs purchasing behavior. Ching-Hsun and Yu-Shan(2014) and Mitchel et al.(2014) pointed out the quality, price, channel, perceived risk of GAPs, the development of new products, the reliability of the sources of recommended information, the publicity, etc were also affect consumers' purchase behavior. [4-5]. Zhang and Wang (2009) found that consumer willingness to purchase GAPs is also significantly affected by the market norms, consumer attitudes and other factors taking Guangzhou City as an instance [6].

Guo et al. (2014) designed a questionnaire to verify that urban residents' consumption of GAPs has been significantly affected by income and family size. The higher the education levels of consumers, the lower the actual consumption of GAPs. Age and green information concern had a significant positive impact on the frequency of consumption of GAPs; health consciousness had a significant negative impact on the consumption frequency of GAPs; the gender had no significant difference [7].

Therefore we make two hypotheses:

H1: Green awareness will positively affect GAPs purchasing behavior

H2: Marketing elements will positively affect GAPs purchasing behavior

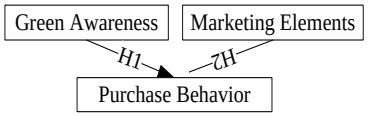

Fig. 1. Research Model

III. EMPIRICAL RESEARCH

In order to investigate the consumer's awareness and consumption of GAPs deeply, we combine scholars' research and make interviews with relevant experts; the questionnaire mainly includes two aspects. One is the basic demographic survey (gender, age, region, education level, occupation, per annual household income, marital status). Another part is consumption status quo of GAPs, including purchase frequency, the degree of consumers' GAPs awareness, whether to buy, purchase channels, category, reasons for buying and reasons for not buying, as well as the acceptance attitude towards price, channel, brand. The questionnaire is mainly distributed through the Questionnaire Star. Invalid questionnaires are deleted. A total of 110 questionnaires are collected.

A. Questionnaire Descriptive Statistics

Descriptive statistical analysis of the questionnaire is showed in Table 1.

TABLE I. BASIC INFORMATION STATISTICS FROM RESPONDENT

Unit: thousand Yuan

Indicators	Feature	No	%
Gender	Male	42	38.18%
	Female	68	61.82%
Age	Under 24	26	23.64%
	25 -35	41	37.27%
	35-45	29	26.36%
	45-55	14	12.73%
Area	Urban	51	46.36%
	County and town	59	53.64%
Education	Below Junior high school	25	22.73%
	High school	26	23.64%
	junior college	13	11.82%
	Bachelor or above	46	41.82%
Occupation	Employee	35	31.82%
	Civil servants	14	12.73%
	educators	23	20.91%
	Peasants	10	9.09%
	Student	26	23.64%
	Other	2	1.82%
Per annual household income	Less than 10%	8	7.27%
	10-30%	38	34.55%
	30-50%	53	48.18%
	More than 50%	11	10.00%
Marital Status	Unmarried	34	30.91%
	Married with children under 6	40	36.36%
	Married with children aged 7-18	36	32.73%
	Other	0	0.00%
Purchase frequency	Often	28	25.45%
	Occasionally	69	62.73%
	Never	13	11.82%

It can be seen from the table that the sample is some representative to a certain degree.

B. Analysis of Consumer Behavior

1) Purchase frequency and proportion. Green agricultural products are gradually accepted by the public, but the actual purchase volume is still small. 60% consumers have bought GAPs, which indicates that consumers recognize the positive impact of GAPs on the environment. But the proportion of GAPs purchase amount accounting for whole agricultural products is 65% (less than 30%) because of higher price, limited options and channels.

2) Difference analysis. There are more women than men in the purchasing GAPs, mainly because women are generally the main purchasers of the family. The participants with children below 18 are the main force of purchasing GAPs, which shows that families are very concerned about the health of adolescents. However, this does not mean that the single one does not care about the quality of agricultural products, but rather that he has less time to cook his own. The urban dwellers are the main group purchasing GAPs Urban dwellers are the main group to buy due to higher green awareness and channel convenience. The group having occupation with higher salary are more willing to buy GAPs, such as corporate formal staff and civil servants, but there is no difference in education. Another finding is that the higher per annual household income, the greater the possibility of purchasing GAPs.

3) Green awareness. Consumers have a low awareness of GAPs as a whole. Over 50% of consumers are vague about the concepts, grades and signs of GAPs, 27% researcher have better perception on GAPs while 23% just have little. Most consumers know that GAPs are healthy, environmentally friendly, pollution-free safe and good-quality food. More than half of them (67.8%) are able to identify the sign rather the grade of GAPs.

4) Identification of GAPs. GAPs require the identification and permission of specialized agencies to use the green logo. 47.1% of them utilize green signs to identify GAPs. Intuitive feeling (21.3%) and product brand (13.8%) are also a common way to identify that. On the one hand, this result represents that

the green logo (certification mark) and product brand (corporate identity) are important factors to attract consumer to buy; on the other hand, this result means that consumers are still relatively vague for GAPs, and the branding of green products needs to be strengthened.

5) Category. The most commonly purchased GAPs are: vegetables, fruits, meat products, dairy products, food, soy products, and aquatic products (according to the order of purchase frequency). The middle-aged and elderly people pay more attention to vegetables, meat products, dairy products, soy products and aquatic products than young people. On the one hand, middle-aged and elderly people are more responsible for purchasing agricultural products of the whole family. On the other hand, older people know more about safety and health issues.

6) Ways to buy. The purchase channels of GAPs are dominated by supermarkets (49%), followed by farmers 'markets (39%), while the sales of agricultural products are mostly farmers' markets, indicating that the channels for GAPs still need to be improved.

7) Marketing elements. GAPs are not cheap compared to common one, 56.7% respondents think that the prices of GAPs are not acceptable, 30.6% think that they are moderately accepted and 12.7% are acceptable. Channel convenience is not strong, 41.3% respondents consider that it's not easy to buy GAPs. Brand awareness is not high, 67.2% respondents say that GAPs are lacking in brand, which is also one of the reasons that the GAPs purchase rate is not high.

C. Reliability and Validity Analysis

In this study, the reliability of the questionnaire is analyzed by using SPSS19.0 software. The Cronbach's Alpha is 0.698, which is greater than 0.6, so the questionnaire is reliable. The validity of the test is tested by KMO = 0.718 and Sig = 0.000, it passes the significance test and is suitable for factor analysis. Next, the principal component analysis is carried out by taking awareness of GAPs, price, convenience and brands as the influencing factors.

TABLE II. PRINCIPAL COMPONENT ANALYSIS RESULTS

Factors	F1	F2
Awareness1(A1)	0.640	
Awareness2(A2)	0.522	
Awareness3(A3)	0.713	
Price		0.789
Convenience		0.641
Brand		0.694
Factor variance contribution rate(%)	36.141	25.946
Accumulated variance contribution rate(%)	36.141	62.087

According to the above principal component analysis, there are two public factors, renamed them as green awareness (F1), and marketing elements (F2) respectively. The accumulated variance contribution rate is 62.087%.

$$F1 = 0.640 * A1 + 0.522 * A2 + 0.713 * A3$$

$$F2 = 0.789 * \mathrm{Price} + 0.641 Convenience + 0.694 * Brand$$

The samples are reprocessed from the above formula to obtain the values of F1, F2 for each sample, and the following regression analysis is conducted based on the recalculated values.

D. Regression Analysis

Taking the proportion of purchasing GAPs as the dependent variable (denoted as Y), regression is made regarding F1 and F2 as independent variables. The model summary result is shown in Table 3.

TABLE III. MODEL SUMMARY

Model	R	R-square	Adjusted R-square	Standard Error of Estimate
1	.759[a]	.576	.562	.482

a. Predictors: (constant) F1, F2.
b. Dependent Variable:Y

R and R-square are within the acceptable range, therefore, the independent variable in the model has a good explanatory effect on the dependent variable.

TABLE IV. REGRESSION RESULTS

Model	Non-standardized Coefficient		t	Sig.
	B	Standard Error		
(Constant)	1.582	.185	3.149	.002
F1	.605	.078	3.904	.000
F2	.567	.065	3.359	.001

From Table 3 the significance of the constant term and F1, F2 all pass the test. Therefore, the regression equation is:

$$Y = 1.582 + 0.605F1 + 0.567F2$$

According to the above experimental results, Assumptions H1 and H2 are all supported. That is, green awareness and marketing elements all positively affect consumers' green agricultural product purchasing behavior to a certain extent.

E. Discussion

1) Green awareness positively affects GAPs purchasing behavior. So increasing green agricultural product publicity and raising people's awareness level can promote people's green consumption.

2) Marketing elements positively affects GAPs purchasing behavior. Appropriate price strategy can stimulate the consumption of GAPs; the more convenient channels, the easier for consumers to buy; in addition, the branding of GAPs will also affect consumers' purchasing. Because many consumers tend to consume products with popularity, Reputation of the product.

IV. SUGGESTIONS

A. Science and Flexible Price Strategy

Science and flexible price strategy means comprehensively analyzing all kinds of factors that affect pricing, such as production costs, market demand, market competition and national laws and regulations. Small profits and quick sales strategy can be applied to green agricultural enterprises that want to gain more profit by occupying larger markets. High-priced strategy can be adopted for those green products with limited resources and markets if consumers are willing to pay high prices for health and fashion. In addition, seasonal differences and regional differences in agricultural products

and consumers' innovative can be used to flexibly set prices in order to reduce consumer's sensitivity to the price of GAPs.

B. Choose the Appropriate Distribution Channels for GAPs

The investigation shows that the most important channel for consumers to purchase GAPs is the supermarket, followed by the farmers market. Therefore, the operators of GAPs should establish sales channels mainly for large-scale supermarkets and vegetable stores. On the other hand, the characteristics of standardization, standardization, industrialization and high-tech of GAPs determine that the development of this industry should be led by professional cooperatives, R & D institutions and leading enterprises. "Company + Base + Farmer" or" Company + Farmer "and other business models should be utilized. Agricultural enterprises can adopt "super-docking" or outlets to highlight the advantages of direct supply of GAPs, provide more varieties of GAPs, and improve the quality and safety of GAPs to meet different consumer groups' quality requirements.

C. Build Green Agricultural Product Brand

Green agricultural product producers and marketers should strengthen the marketing, not only in the sales link, but also in other parts of the supply chain, for example, transport and storage in logistics. Agricultural enterprises can promote consumer spending on GAPs by implementing green marketing, accurately segmenting and positioning the market to establish its own green brand and accumulate brand equity through the newspapers, magazines, television, Internet, lectures and other ways to strengthen the its promotion.

At the same time, the government should encourage the development of green industry and formulate policy incentive and fund support to green agricultural enterprises

V. CONCLUSION

This research represents one of the first empirical studies utilizing questionnaire to investigate green awareness and marketing elements on purchasing behavior. The result shows that consumers have more green cognition about GAPs; they are more likely to buy. And the development of green agricultural enterprises is restricted by high price, poor accessibility and low brand awareness. It is time to take actions to find a way out for the green agricultural products while taking the difference in age, gender, region, occupation, income into account.

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