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Research Article

Research on Operating Performance and Integrated Logistics Network of Livestock Supply Chain based on Green Food Consumption

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Abstract: In recent years, logistics network increase fast and has a significant impact on the local economy. For fresh agricultural products, including vegetables, fruit, poultry, eggs, aquatic products, meat, dairy products and other, supply chain is not only a connection between suppliers and customers and also a value-added process. In this study, we analyze the integrated logistics network of livestock supply chain and find out the factors that will affect the consumer decision. The result shows that food safety, logo cognitive and brand sensitivity have positive influence to consumption. So that, in order to increase customer satisfaction and promote customer relationship, enterprises should strengthen the integrated management of livestock supply chain, improve the speed of logistics distribution and service quality.

Keywords: Green food, integrated logistics, livestock supply chain, operating performance

INTRODUCTION

In recent years, green food consumption increase fast and has a significant impact on the rural economy. As city residents return to nature tourism demand exuberant, village tourism gradually show a strong life force and attracting force. In the village tourism development process, agricultural product development and marketing has become important issues (Anne, 1996; Baoren, 2011). In the village tourism, agricultural products marketing as a platform, it can help reducing the cost of agricultural products and increase the added value, drive rural related industry development and further adjusting rural industry structure. The green food industry in our country has been developing. As China is a resource constrained countries and the relative shortage of resources and fragile environment also has been polluted and destroyed (Emese and Carlos, 2011), so the development of green food industry is a good choice (Mkono and Kevin, 2013). At present our country has considerable scale and the amount of green food production enterprises, but also the new certification of green food enterprises; the annual number of products using mark number, environmental monitoring area and green food production base of green food product physical volume were increased year after year

China's township village tourism developing rapidly and has become a China's tourism the important force (Li and Chen, 2012). By the multiplier effect in tourism should be large, comprehensive and strong, village tourism for the solution of urban and rural overall planning and construction of the socialist new village, the effective way. At the village tourism development process, the agricultural product development and marketing has become a cannot be ignored important issues (Vadivambal and Jayas, 2007). With the growing homogenization of products, the physical properties of the products the gap continued to narrow, distinguish the role of brand is increasingly enhanced, the brand research becomes a hot spot. John and William (1991) first put forward the brand manager system, the research of brand theory experienced stage of brand, brand strategy, brand equity, brand stage management stage, stage 5 stages of brand relationship. Brand relationship is the relationship marketing theory in the use of the brand level, is the new stage of the development of the theory of brand. In this study, drawing on existing research, consumer behavior research of green food from the perspective of the relationship between the brands.

At the village tourism concept, foreign scholars put forward the concept of general contain three key elements: the village environment, traditional culture and tourism function (Thomas and Michael, 2011), this is a group of village tourism concept interpretation of the theory element, also is a village tourism from the root zone don't the him to travel form sign. Lane thinks the village tourism should at least have five characteristics as located in village, tourism activities with village, the small scale, the social tradition of culture and type of diversity. Ahumada and Villalobos (2011) pointed out that agricultural tourism, farm tourism and green food consumption is no substantial difference between three different forms of tourism and especially tourist village to remote villages to

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experience the traditional culture and folk culture tourist activity. At the village tourism sustainable development aspect, many scholars put out rural village protection, environmental governance and village heritage development. Daniel (2013) proposed the village travel towards rational, harmonious and perfect the continued to develop, is not to green food consumption activities of the inevitable trend. Victoria (2011) pointed that the village tourism development need to strictly protect the rural region, well coordinated protection and development department, village of holding the village, because of the green food consumption's sustainable development is essential and necessary.

Modern agricultural product marketing theory originated in the United States, the upper half of the nineteenth Century. The rapid development of American agricultural industry is very big degree is from industry civilization to promote the development of the agricultural industry (Aliza and Anat, 2005; Zhang and Chen, 2013), rapid development has also brought a series of questions, such as product surplus problem and with this problem more and more serious, people gradually explore various kinds of methods and techniques to promote the sale of agricultural products, agricultural products to market marketing theory with the birth of. Into twenty-first Century, the agricultural products marketing theory with marketing practice and new development (Li, 2014), began to explore how to some new ideas, new methods should be used in agricultural products marketing practice, is born in relationship marketing, service marketing, green marketing, brand marketing and other marketing mode. In agricultural products marketing, Zhou (2013) pointed out 13 counties of Beijing city green food consumption development mode in the total node, the total node than the whole surface of the ten types of village tourism development main mode. Li and Ning (2012) pointed out Chengdu farm music and Beijing folk custom village of two kinds of development mode and analyzes the two modes of the problem, put forward the positive development of policy. Ning and Li (2013) summarized in recent years our country village tourism in the development process is the relevant theoretical research, science knowledge, product development and so on many questions, in this basis, put forward constructive development strategies slightly. Chen and Zhou (2013) think that at present our country green food consumption in question include tourism product primary, no note environmental protection meaning ring, management is not perfect and the farmers service consciousness is not strong and the needle on these questions are provided suggestions.

Scholars point of view in the main set in several aspects: improve the tourism from the industry personnel quality (Li, 2013); provide new tourism product, avoid the tourism product development level is low and the repeatability is high (Qing and Li, 2014); the importance of village tourism to the community and environment and so on questions; establish reasonable interest distribution mechanism.

MATERIALS AND METHODS

Empirical research framework: Through analyzing the existing literature and combined with the research angle to the brand relationship, brand as one of the factors affecting consumer behavior into analysis. The other possible factors such as: consumers' demographic variables, concern for the environment, food safety evaluation, green food, such as cognitive places to buy non brand factor analysis. In this study, the empirical part as two stages sequentially. The first stage, understand the influencing factors of green food consumers' purchase decision; the second stage, to understand the impact of brand relationship on green food consumer behavior. Between these two stages are closely linked, because the trial exploration to understand whether the brand effect of green food consumption, which provides a reference for the continued research; research and follow-up, the results can strengthen the front. This study first consider these factors of brand and non brand single factor effect on green food consumer decision making; and then, the influence of reuse Logistic analysis model of these factors on the green food consumption and quantification. In many factors, understand the brand factors on green food consumer behavior whether to have a significant effect, this is the first stage of the study, have the basis for the first stage of the study, then analyzed the second stages of the. We make questionnaire and statistical analysis method by using the quantitative analysis method of deep study of effect of brand relationship on green food consumer behavior. Based on brand relationship quality to measure brand relationship: the research frame of customer value of consumer behavior in the model of customer value, customer satisfaction and customer loyalty and other variables which to explore consumer psychology and consumer behavior. To understand the relationship between brand relationship and customer value, customer satisfaction and customer loyalty through a series of analysis.

Variables and hypothesis: This study makes an empirical research on green food consumer behavior, need to use the personal characteristics variables (gender, age, including occupation, education level and family average monthly income), concern for the environment, food security concerns, where to buy green food logo status, cognition, affect the willingness to pay premium, brand sensitivity variables such as the research on green food purchasing the decision factors; use of brand relationship quality (including partner quality, trust, commitment), research on customer value, customer satisfaction and customer loyalty based on brand relationship variables such as green food consumer behavior data sources and sample basic characteristics. The personal characteristics variable

including gender, age, etc., considering the gender in the social and family status and division of differences, gender within factors analysis. Whether gender have influence on the green food consumption, at present had different results in different studies. Age affects the concepts and ways of consumption, different age stages of consumers have different consumption characteristics, unique and purchase behavior. Income level directly affects the consumers' purchasing power level. The possibility of high and low income levels and consumption will change consumer behavior related to the size of the place, but not directly determines whether or not the consumer behavior. Once again on the basis, we put out propose one as:

H1: The influence of demographic variables on the green food consumption significantly.

Environmental concerns refer to one or more specific environmental phenomena or concerns, relates to cognition, emotion and behavior intention of three or one or two aspects). The influence of the degree of concern for the environment there are two different views: in the part of research, environmental concerns were considered to be the major determining factors of green food to buy. Consumer awareness on the problem of pollution will influence his attitude to environmental protection, but also will influence his attitude to the green lifestyle on environmental attitude, a positive attitude to the green way of life people will participate in the green product purchase and consumption activities. While some of that environmental concerns has not obvious influence on the purchase of green products, behavior, especially compared with the healthy factor. In order to understand the environmental concern about the impact on consumer behavior, we assume that:

H2: Environmental concern significantly influence on green food consumption.

Safety is the basic demand of food consumption. So the safety evaluation of green food on consumer behavior may influence. This hypothesis as:

H3: Food safety significant effects on green food consumption.

With the accelerated pace of life, most people pursue the convenience in shopping and it namely shopping convenience to some extent on the impact of green food consumption decision. Buy place of choice is a manifestation of shopping convenience, in order to know the places to buy influence on green food consumer behavior, we assume that:

H4: Buy place significant effects on green food consumption.

Consumer understanding of green food directly affects the consumers' understanding and judgment of the green food, has decided the consumer evaluation on the value of green food and the consumption of consumer attitudes, thereby affecting the consumer behavior. Understanding of green food logo or not is of green food a degree of understanding. In order to influence the green food logo cognition on green food consumer behavior, we assume that:

H5: Green food logo cognitive significantly influence on green food consumption.

Green food production process determines the production cost is relatively high, a consumer willingness to pay for green food premium also affect consumer behavior.

H6: Payment will significantly impact on green food consumption.

Brand sensitivity is a psychological variable, refers to the consumer for a given product category to carry on the purchase decision-making brand play a crucial role in the degree of. The unique and personality of brand can meet the consumer's psychological difference. At the same time the brand with high additional value can reduce the sensitivity of customers to price.

H7: Brand sensitivity significantly influence on green food consumption.

Consider the relationship between brand relationship and customer value. High quality brand relationship, not only means that the multi hierarchical relationship between brand and consumer, but also means that the mutual interests can make customers receive superior customer value and therefore high brand relationship will get higher customer value. Specifically: consumers in the trust, will more actively communicate with the enterprises, but also for the brand trust degree is more high, the consumer more easy to believe that make the business interests guarantee, to reduce the risk perception, have higher customer value. Therefore, we put forward the hypothesis:

H8: Brand relationship significantly influence on the green food consumption.

The relationship between customer value, customer satisfaction and post purchase behavior has always been the research focus in the marketing literature. The analysis based on the research literature on the relationship between their results: the customer value and the customer satisfaction is more complex. However, the enterprise only by continuing to provide

Table 1: Statistical analysis of collected data

Variable	Min.	Frequency	(%)	Valid (%)	Cumulative (%)
Gender	Male	149	41.74	41.74	41.74
	Female	208	58.26	58.26	100.00
Age	Under 18	43	12.04	12.04	12.04
	19-30	101	28.29	28.29	40.33
	31-45	88	24.65	24.65	64.98
	45-60	84	23.53	23.53	88.51
	More than 60	41	11.49	11.49	100.00
Income	Under 1500	40	12.61	12.61	12.61
	1600-3000	175	49.02	49.02	61.63
	3000-5000	77	21.57	21.57	83.20
	More than 5000	60	16.80	16.80	100.00
Professional	Technical staff	95	26.61	26.61	26.61
	Management personnel	88	24.64	24.64	51.25
	Ordinary employees	123	34.45	34.45	85.72
	Other	51	14.28	14.28	100.00

Min.: Minimum

Table 2: The cross aggregation of the double variables

Double variables	Coefficient	Variance	df	Significant	Result
Gender and consumption frequency	0.358	34.642	4	0.000	Significant correlation
Professional and consumption frequency	0.102	60.908	8	0.100	No sig. correlation
Age and consumption frequency	0.343	61.668	8	0.002	Significant correlation
Education degree and consumption frequency	0.180	21.802	8	0.130	Significant correlation
Average monthly income and consumption frequency	0.353	44.485	8	0.000	No sig. correlation
Environmental concerns and consumption frequency	0.081	17.252	6	0.080	Significant correlation
Food safety concerns and consumption frequency	0.572	42.793	3	0.000	No sig. correlation
Food location and consumption frequency	0.427	35.446	3	0.000	Significant correlation
Green food cognition and consumption frequency	0.446	33.271	2	0.000	Significant correlation
Willingness to pay and consumption frequency	0.537	42.743	2	0.007	Significant correlation
Brand sensitive frequency and consumption frequency	0.627	54.700%	2	0.000	Significant correlation

value for customers in order to obtain a high level of customer satisfaction level and reliable and consistent and the continuing customer satisfaction level can guarantee customer loyalty height. So we put forward the following hypothesis:

H9: Customer value, customer satisfaction has significant effects on customer loyalty.

Sample estimation: In sample size, social research seems to have no consistent conclusion. Most social science researchers think between confidences ranged from 90 to 95% is acceptable. Calculation of number of samples with sampling formula, with 90% confidence, obtain the number is 269. Sample quantity calculation formula is as follows:

$$N = \frac{Z_{a/2}^2 \times p(1-p)}{e^2} \quad (1)$$

In the formula, N is the sample size and Z is the standard normal variables. This study uses the confidence interval, 90% Z = 1.64; P matrix ratio, set to l/2; E is the error value, the study adopts 5%. Get the N = 269, in order to get 269 valid data, taking into account the reasons item design, some questions will filter out part of the respondents, thus increasing the access object, interview 422, got 357 copies of valid questionnaires.

RESULTS AND DISCUSSION

Data statistical analysis: For the analysis of the influencing factors of consumer behavior of green food, the related data need to obtain green food consumers' consumption situation. This study selected Suzhou City of green food consumer survey, investigations of random sampling survey time is in 2014 June, the survey questionnaires were distributed and 400 copies, eliminating the leakage answer key information and the emergence of obvious mistakes in the final questionnaire, obtained 357 valid questionnaires, effective recovery ratio of 89.25%. The basic statistical characteristics of the respondents are shown in Table 1.

Descriptive analysis: The influence factors of the section and the lower section on green food consumer decision making. First of all, gives this research variable meaning and assignment; and then, effect factors on green food consumer behavior by using descriptive analysis of Crosstabs process, Crosstabs process is through the cross summary two variables, calculate the corresponding relations between them. So from the numerous information and find out the key influence factors of green food consumers' buying behavior and then focus on the key factors by using Logistic regression. Using the SPSS 13.0 Crosstabs process of summary for each variable and consumption frequency variable cross, get their correlation coefficient, to understand their correlation. The results are shown in Table 2. From Table 2, we can get that

Table 3: Model fitting information

Model	Likelihood	Variance	df	p-value
Contains only constant terms	672.787			
Final model	476.160	196.626	14	0.000

Table 4: The aggregation of the regression

Hypothesis	(p<0.05)	Results
Effect of gender on green food consumption	0.022	Pass
Effect of age on the green food consumption	0.000	Pass
Effect of occupation on the green food consumption	0.189	Not pass
Effect of income on the green food consumption	0.026	Pass
Effect of environmental concerns on green food consumption	0.126	Not pass
Effect of brand sensitivity on green food consumption	0.000	Pass
Effect of food security concerns on green food consumption	0.001	Pass
Effect of green food logo cognitive on green food consumption	0.003	Pass
Effect of willingness to pay on green food consumption	0.015	Pass

Table 5: KMO and Bartlett's test

	KMO test	0.798000
Bartlett's test	Approximate×2	1720.767
	df	91.000
	Significant	0.000

gender, age, average monthly household income, food security concerns, where to buy food, green food cognition, willingness to pay and the brand sensitive and significant influence on green food consumption. However, occupation, education background and environmental concern are not significant. The following factors continue to influence significantly the ordinal regression analysis.

Ordinal regression analysis: Descriptive analysis by using Crosstabs process, get the brand factors and non brand factors separately and the corresponding relation between the green food consumption. In the study, the frequency of consumption is difficult to measure accurately, this study is simplified: the consumption frequency divided into never consumption, occasionally consumption and regular consumption as three kinds of situations. In the Logistic regression model, in accordance with the strain categories defined order, also the occurrence model than is through the incidence ratio molecules in the event probability sequentially continuous accumulation. We make ordinal regression analysis by using SPSS 13.0, as shown in Table 3 and 4.

From the Table 4, we can get that occupation; environmental concerns were not significant effect on green food consumption. Occupation is not significantly affected, possible explanation is: as income levels improve people more opportunities to green food consumption and extensive sharing of information, information occupation differences caused by nature is no longer significant. Some elderly people, they pay more attention to health, pay attention to the issue of food safety and they have sufficient capacity to pay, so the difference in level of age is not enough to significantly affect the green food consumption. Environmental concerns may explain the effect on the green food consumption is not obvious: people's behavior in the maximization of their own interests and environmental concerns are more altruistic risks, consider altruism usually brings a personal action cost and even economic cost and most consumers are unwilling, for the benefit of society to abandon too much personal interests.

In addition, gender, age, income, security concerns, where to buy green, cognition, willingness to pay and the brand sensitive and significant influence on green food consumption. The brand is sensitive to green food consumption significantly affected confirms the research hypothesis. Because of food safety problems, consumers have a lot of potential demand for green food, but the asymmetric information of green food trade affects the conversion from potential demand to actual demand. Brand is a kind of contractual commitments, to a certain extent, reduce the degree of information asymmetry, enhance consumer confidence and increase conversion of the potential demand into real demand of green food. Therefore, the brand has great influence on green food consumer behavior.

Validity and reliability analysis: Based on the brand relationship scale by factor analysis, the data are processed with SPSS 13.0, using the orthogonal rotary shaft to analyze, extract the feature values greater than one factor. Factor analysis on brand relationship scale, make items cut according to the factor loading of statistics. In the brand relationship scale with 16 questions, then delete the fourth and eleventh questions analysis of second factors, are presented in Table 5.

The results showed that the KMO statistic is 0.798, suitable for factor analysis. Bartlett's spherical test of value is 1720.767, reached the significant level ad $p = 0.000$, is less than 0.01, rejected the original hypothesis unit correlation matrix, it means enough to be used as a factor analysis extracted factors with correlation coefficient. After analysis, get 3 common factors, the cumulative explained 62.848% variance. Table 4 for specific factor loading, the results of factor analysis are as follows: the R3 factor is consistent with the hypothesis, this study R1, although R2 deleted a question, consistent with the principle of hypothesis, the results show that the validity of measurement of high.

Table 6: Factor and reliability of brand relationship scale

		Rotated factor loading				Rotary shaft squared loadings (sums)	
Factor	No.	R1	R2	R3	Cronbach's α	Charac. value	Variance cont. (%)
R1 partner	1	0.861	-0.009	0.034	0.8324	3.985	28.546
quality	2	0.762	0.001	0.110			
	3	0.764	0.007	0.094			
	4	0.745	0.205	-0.105			
R2 trust	5	0.179	0.852	0.070	0.8206	2.512	18.243
	6	0.006	0.784	-0.131			
	7	-0.204	0.668	0.090			
	8	0.206	0.206	0.183			
R3 commitment	9	0.085	-0.012	0.772	0.8158	2.425	16.516
	10	-0.074	-0.065	0.752			
	11	0.096	0.073	0.864			
	12	0.234	0.126	0.759			

Reliability analysis using the SPSS 13.0 version of the Cronbach's α coefficient to determine for certain measurement factors, different problems results consistency. The results are as shown in Table 6. In general, Cronbach's α reached 0.5 consistencies that the measurement result is good, if the Cronbach's α coefficient can reach 0.8 or even higher, so the measurement results consistency is very good. From the result in Table 6, 3 factor Cronbach's α coefficient reached a satisfactory level, the higher the credibility of the brand relationship scale.

CONCLUSION

In this study, through the theoretical study and empirical, we make comprehensively analysis on green food consumer behavior based on brand relationship, the following conclusions can be drawn: gender, age, income, security concerns, where to buy green food, logo, cognition, willingness to pay significant influence on green food consumption and occupation, level of education, environmental concerns are not significant effect on green food consumption. And brand influence factors on green food consumer decision-making significantly. Through the above analysis the green food consumer behavior, a better understanding of the influence factors of green food consumption, we respectively for green food market of green food has made the following recommendations of the important role of two kind of main body of government and enterprises.

The government as the market management, it main body plays the role of macro-control on the green food consumption. Therefore, the government should conduct propaganda, supervision and support and other aspects, to strengthen the regulation and control. First of all, to strengthen the publicity, advocate green consumption. The above mentioned in the conclusion part, the green food logo recognition of green food consumption decision significantly influence. Therefore, the government should increase the green food propaganda; let more people know about green food, green food and green food approval. To establish a green consumption consciousness through the related knowledge popularization of green food, the formation of the concept of green consumption, become green consumers, set off a wave of green food consumption.

Secondly, government should strengthening supervision and improving the market environment. At present, the green food market is still a small number of unscrupulous manufacturers of fake and shoddy products, damage the reputation of green food. In the empirical study also found that trust is one of the significant dimensions influence green food consumer behavior. It not only directly affect customer loyalty, but also through the to: customer satisfaction customer loyalty indirectly affects customer consumption path. Therefore, to enhance consumer trust has an important role to promote green consumption. For the government, should strengthen supervision by administrative and legal means, to ensure product quality as the core, to implement the standardization of production as the main line; to strengthen the identity management, market access management, to prevent free riding phenomenon, protection of green food security; to strengthen the quality and integrity of management, the government not only to organize the relevant departments and technical supervision, industrial and commercial management together, step up efforts to protect the brand of green food, but also to improve social inspection and supervision work, launched a vast number of consumers supervision, protect consumers of their rights; so that the whole society action, the maximum improvement of green food market environment, enhance the trust degree in green food consumption.

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