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# Urban Residents' Food Safety Awareness and Purchasing Decisions about Name-brand Livestock and Poultry Products: A Case Study of Beijing City

Ning ZHU, Fu QIN\*

Institute of Agricultural Economics and Development, Chinese Academy of Agricultural Sciences, Beijing 100081, China

Abstract Through the data on Beijing urban residents' purchasing decisions of the name-brand livestock and poultry products, the article analyzes consumers' food safety awareness about the name-brand livestock and poultry products and the effects on the purchasing decisions of the name-brand livestock and poultry products. Research shows that urban residents obtain information on food safety through TV programs and newspaper and there are a great of problems in food. 55.43% of the consumers consider that the name-brand livestock and poultry products are safer than ordinary livestock and poultry products. The result of the model shows that food safety awareness about the name-brand livestock and poultry products has dramatically affected urban residents' purchasing decisions of livestock and poultry products. The biggest effect is on the brand of eggs and pork as the major daily consumer goods. Furthermore, income and prices are still the determining factors affecting the consumers' purchasing decisions of the name-brand livestock and poultry products. And the features of livestock and poultry products (nutrition, taste) significantly affect the name-brand livestock and poultry products.

Key words Food safety awareness, Urban residents, Name-brand products, Purchasing decisions

#### 1 Introduction

In recent years, food safety issues concerning livestock and poultry products have been a widespread concern, and some unexpected events such as "clenbuterol event" and "melamine incident" have seriously affected consumers' confidence in the food safety of livestock and poultry products, posing a very serious negative impact on the development of livestock and poultry industry. The namebrand livestock and poultry products developed in this context have become the products that consumers prefer, mainly because most of the name-brand livestock and poultry products have traceability features, and the brand has become an effective way to solve the problem of food safety<sup>[1]</sup>. From the present study, the majority of scholars believe that the main factors influencing consumers' purchase of livestock and poultry products include product features and household characteristics. Food safety, as one of the product features, has an increasingly impact on household consumption of livestock and poultry products, because consumers are increasingly concerned about food safety<sup>[2-4]</sup>. From previous studies, it can be found that the studies are mostly placed on pork consumption<sup>[5-9]</sup>, and there are few studies of other livestock and poultry products. Some scholars study the consumers' willingness to pay for the fresh meat with food safety mark, and the research shows that the traceability mark can to a certain extent increase Chinese consumers' willingness to pay<sup>[10]</sup>. In addition, scholars' study on the consumption of China's name-brand livestock and poultry products has just started. Some studies show that the awareness of food safety of name-brand products has become a significant factor affecting the consumption of name-brand livestock and poultry products<sup>[11-15]</sup>. Based on previous studies, it is found that food safety problems have a significant impact consumers' purchase of livestock and poultry products, but there is still a shortage of studies on the impact of food safety awareness of livestock and poultry products on consumers' purchasing decisions of name-brand livestock and poultry products. And it lacks empirical analysis on comparing different name-brand livestock and poultry products purchased by residents in big cities. In the above context, this study focuses on the urban residents' purchase of name-brand livestock and poultry products in Beijing City, and uses econometric model as a tool to analyze the effects of urban residents' food safety awareness of name-brand livestock and poultry products on their purchasing decisions. This paper also sets forth the targeted recommendations for increasing urban residents' purchase of namebrand livestock and poultry products, in order to provide a reliable basis for introducing the policies concerning the development of name-brand livestock and poultry products based on food safety.

## 2 Theoretical basis, research methods and variable selection

**2.1 Theoretical basis** According to economic theory, consumers' purchase of products is affected by price of the product, consumers' income levels, consumers' preferences, attributes of the product and other factors. The product price and income levels have a decisive impact on consumers' purchase of products, and as income levels increase, the elasticity of consumption of some products decreases slightly while the elasticity of consumption of livestock and poultry products still maintains a high level, indicating

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\* Corresponding author. E-mail: qinfu@ caas. cn

that price and income are still significant factors affecting the consumption of livestock and poultry products. In addition, consumers' preferences and attributes of the product show that it needs product attributes to meet consumers' preferences when consumers realize purchasing decisions. Based on food safety, this paper analyzes the impact on consumption decisions about namebrand livestock and poultry products. This study is to validate a hypothesis: consumers' food safety awareness on name-brand livestock and poultry products has a significant positive effect on the purchasing decisions about name-brand livestock and poultry products.

**2.2 Research methods** Logit model is a type of probabilistic statistical classification model. It is also used to predict a binary response from a binary predictor, used for predicting the outcome of a categorical dependent variable based on one or more predictor variables. It is also possible to motivate each of the separate latent variables as the theoretical utility associated with making the associated choice, and thus motivate logistic regression in terms of utility theory. In terms of utility theory, a rational actor always chooses the choice with the greatest associated utility. This study selects Logit model to analyze the effects of food safety awareness on the urban residents' purchasing decisions of name-brand livestock and poultry products, mainly because purchasing decisions are the choice behavior. The specific form of Logit model is as follows:

$$\operatorname{Logit}(P) = \operatorname{Ln}(\frac{P}{1-P} = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_{i \times i} + \varepsilon_i$$

where  $\beta_0$  is the intercept parameter;  $\beta_i$  ( $i = 1, 2, \dots, n$ ) is the regression coefficient;  $x_i$  ( $i = 1, 2, \dots, n$ ) is the explanatory variable matrix;  $\varepsilon_i$  is the error term.

#### 2.3 Variable selection

**2.3.1** Product features. The product features include nutrition,

Table 1 Basic information of samples

Items	Pork	Cnicken	Beei	Lggs
The number of samples purchasing name-brand livestock and poultry products	154	103	126	83
Proportion of name-brand livestock and poultry products to total livestock and poultry products purchased//%	53.31	77.73	84. 16	80.17

Table 2 Beijing urban residents' concern about food safety

Category	Specific items	Value	Number/mean	Proportion/%
Food safety	Whether to pay attention to the issue	0 = no	26	9.74
•		1 = yes	241	90. 26
	Whether the problem is serious	0 = no	45	16.85
	-	1 = yes	222	83. 15
	Whether to pay attention to news reports	0 = no	9	3.37
	• • • • • • • • • • • • • • • • • • • •	1 = yes	258	96.63
	Comparison of food safety between name-	0 = name-brand≤ ordin	ary 119	44. 57
	brand and ordinary products	1 = name-brand > ordina	ary 148	55.43

**3.2 Descriptive statistics** According to the field research and survey, among 267 samples, 241 of them express their concern about food safety issues, accounting for 90.26% of the total samples; 83.15% of samples think the food safety issue is very serious; the source of information on food safety issues is mainly news reports. In addition, 55.43% of samples believe that the name-

taste, price, etc. The product features have a great impact on consumers' purchasing decisions, mainly because the product features directly determine the ability to meet consumers' preferences. Nutrition, taste and price will also influence consumers' purchase of name-brand livestock and poultry products, and especially the price will affect consumer demand due to higher prices of name-brand livestock and poultry products.

**2.3.2** Household characteristics The household characteristics include the food safety awareness on name-brand livestock and poultry products, income, family structure, education and age of respondents. Among them, the food safety awareness is the focus of this study and consumers purchase name-brand livestock and poultry products mainly due to the food safety property behind the brand; income is the decisive factor influencing the purchase of name-brand livestock and poultry products; in order to protect the health of the elderly or adults, the family may buy name-brand livestock and poultry products.

#### 3 Data sources and descriptive statistics

**3.1 Data sources** The data used for this study are from the field survey of urban households by Project Team of Industry Economic Research Office of National Layers Industry Technical System. The survey uses a random sampling method to interview a total of 460 urban residents. There are 433 valid samples, and the validity rate of sample is 94.13%. The data used in this study are mainly related to urban residents' consumption of name-brand livestock and poultry products such as pork, chicken, beef and eggs. After screening, a total of 267 samples can support the study, accounting for 61.66% of the total samples.

brand agricultural products are safer than ordinary agricultural products; 2.62% of samples maintain that the ordinary agricultural products are safer than the name-brand agricultural products; about 41.95% of samples think they are equally safe or have no idea about it.

Based on the above analysis, we builds Logit model to per-

form the empirical analysis of the influence of food safety awareness on Beijing urban residents' consumption decisions of namebrand livestock and poultry products, and the independent variables of model are shown in Table 3. "Comparison of food safety between name-brand and ordinary products" is selected as the in-

dicator for the food safety awareness on name-brand livestock and poultry products, and the indicator can be used to analyze the influence of the food safety awareness on name-brand livestock and poultry products on consumers' purchasing decisions of name-brand livestock and poultry products.

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Variable category	Specific variables	Value	Number/mean	Proportion/%	Expected sign
Product features	Whether it is nutritious	0 = no	234	87.64	+
		1 = yes	33	12.36	
	Whether it is tasteful	0 = no	223	83.52	+
	Whether the prices of name-brand	1 = yes	44	16.48	
	livestock and poultry products have	0 = no	205	76.78	_
	an impact	1 = yes	62	23.22	
Household characteristics	Food safety awareness	0 = name-brand ≤ordinary	119	44.57	+
	Whether there are the elderly in the	1 = name-brand > ordinary	148	55.43	
		0 = no	144	53.93	+
	family Whether there are minors in the	1 = yes	123	46.07	
		0 = no	149	55.81	+
	family	1 = yes	118	44.19	
	Total monthly household income	0 < 8000 yuan	86	32.21	+
	·	1≥8000 yuan	181	67.79	
	Highest household education level	0 = below undergraduate	82	30.71	+
	-	1 = undergraduate and above	185	69.29	
	Respondents' age	Mean	43.27		+

#### 4 Analysis of results

- 4.1 Urban residents' food safety awareness on name-brand livestock and poultry products is a factor significantly affecting the consumption of name-brand livestock and poultry **products** According to the model results in Table 4, we see that consumers' trust in food safety of name-brand livestock and poultry products has a significant impact on pork, chicken, beef and eggs at the 1% level, indicating that consumers choose to consume name-brand livestock and poultry products mainly because of food safety concerns, and name-brand products stand for food safety in terms of consumer awareness, which is also consistent with the previous statistical analysis. In addition, from the four livestock and poultry products, the food safety awareness on name-brand livestock and poultry products has the great impact on the purchase of name-brand eggs, followed by name-brand pork, indicating that consumers are more concerned about the food safety of name-brand livestock and poultry products consumed frequently in daily life, and there are differences in the influence of the food safety awareness about name-brand livestock and poultry products on the consumption of different name-brand livestock and poultry products.
- 4.2 Income is an important factor affecting the consumption of name-brand livestock and poultry products According to the simulation results, it shows that income is a significant factor affecting the consumption of name-brand livestock and poultry products; although it is not as significant as food safety, it can be concluded that the consumption of name-brand livestock and poultry products still needs income as a guarantee, and the consumption elasticity of name-brand livestock and poultry products is still high. Moreover, according to the definition of income in this study, the households with income level higher than that of urban households in Beijing are more likely to consume name-brand live-

stock and poultry products, and the possibility of consuming namebrand livestock and poultry products is small for low-income households.

- **4.3 Prices have a significant impact on name-brand live-stock and poultry products** From the results of the model, price has a significant impact on Beijing urban residents' consumption of name-brand livestock and poultry products, and the impact on name-brand meat is significant at the 1% level, indicating that the price is one important factor affecting the consumption of name-brand agricultural products, and consumers are still more concerned about the price when choosing name-brand livestock and poultry products. This requires companies to make differentiated pricing mechanism and other marketing strategies.
- From the point of view of product fea-4.4 Other variables tures, nutrition and taste have a great impact on the consumption of name-brand meat types while nutrition and taste have a small impact on the eggs, indicating that the egg is a animal product with low consumption elasticity, and the consumer demand for name-brand eggs is far less than the consumer demand for namebrand meat products. Based on such difference, we can adopt different policy measures for the production and sale of name-brand meat and eggs. From household characteristics, the families with the elderly and children have no significant effect on the consumption of name-brand livestock and poultry products; the families with higher level of education will be more willing to consume name-brand pork and eggs, and the respondents with older age are more likely to consume name-brand pork and eggs, mainly because the food safety issues in recent years have been serious, and the consumers with higher quality, older age or higher income will better know the common sense of life, and make a targeted choice of livestock and poultry products.

Table 4 Model results

Product type	Por	rk	Chic	ken	Be	ef	Eggs	
Variable name	Coefficient	Z-value	Coefficient	Z-value	Coefficient	Z-value	Coefficient	Z-value
Intercept	-3.44***	-4.25	-2.33 * * *	-3.34	-3.05 * * *	-3.84	-0.33	-0.52
Nutrition	2. 25 * * *	4.14	0.78 *	1.62	1.78 * * *	3.76	0.66	1.39
Taste	2. 23 * * *	4.76	1.74 * * *	3.72	1.43 * * *	3.60	0.46	1.12
Price	-1.37 * * *	-3.16	-1.97 * * *	-4.77	-1.50 * * *	-3.20	-0.66 *	-2.00
Food safety awareness	1.08 * * *	3.32	0.87 * * *	2.92	0.95 * * *	2.90	1.24 * * *	4.35
Having the elderly	0.27	0.76	-0.28	-0.84	0.04	0.11	-0.16	-0.49
Having children	-0.07	-0.21	-0.37	-1.24	-0.07	-0.23	0.19	0.65
Income	0.46 *	1.81	0.79 * *	2.22	0.69*	1.76	0.52*	1.75
Education	0.85 * *	2.13	0.39	1.11	0.45	1.13	0.59*	1.82
Age	0.02 *	1.77	0.03 * * *	2.46	0.01	1.16	-0.02	-1.60

Note: \* \* \* , \* \* , \* denote 1% , 5% and 10% significance level, respectively.

#### 5 Conclusions and recommendations

Conclusions According to the analysis above, it is found that Beijing urban residents are very concerned about food safety issues, and the main source of information is news report. From the perspective of consumers, name-brand livestock and poultry products have become a guarantee of food safety. By the empirical results, we see that the food safety awareness on name-brand livestock and poultry products has a significant impact on urban residents' purchase of name-brand livestock and poultry products, and there are differences in the influence on the consumption of different name-brand livestock and poultry products. It has the greatest impact on name-brand eggs and pork consumed frequently, and animal product features (nutrition and taste) also significantly affect urban residents' consumption of name-brand meat products. In addition, due to great consumption elasticity of namebrand livestock and poultry products, urban residents' income and price of name-brand livestock and poultry products are still important factors affecting urban residents' consumption of name-brand livestock and poultry products.

#### 5.2 Recommendations

- **5. 2. 1** Strictly controlling the quality of name-brand livestock and poultry products. It is necessary to ensure the food safety in the production, circulation and marketing of name-brand livestock and poultry products. The government departments and enterprises should strengthen inspection and testing to ensure product safety. At the same time, it is necessary to use the marketing tools to introduce the food safety characteristics of name-brand livestock and poultry products in order to attract consumers and use food safety to develop the market of name-brand livestock and poultry products.
- **5.2.2** Implementing the differentiated marketing strategy. Urban residents' income and product prices are still significant factors affecting urban residents' consumption of name-brand livestock and poultry products, so there is a need to further subdivide the consumer groups according to income level and affordability and fully consider the demand of different consumer groups, thereby expanding the sale coverage of name-brand agricultural products and enhancing the consumers' confidence in purchase.
- **5.2.3** Maintaining and developing characteristics of name-brand livestock and poultry products. Nutrition and taste have a significant impact on the consumers' purchase of name-brand meat prod-

ucts, and it is necessary to pay attention to the nutrition, taste and freshness of products in production, logistics and sale links, to meet consumer demands for product. In addition, it is necessary to conduct a survey on consumers' demand for name-brand livestock and poultry products to guide the production of name-brand livestock and poultry products.

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gang and Li Fengting also came up with their recommendations for increase of farmers' income in line with specific regions  $^{[19-22]}$ .

#### 4 Conclusions and discussions

The issue of farmers' income is always a hot spot in various circles of society. Many domestic and foreign scholars have made extensive studies on increase of farmers' income from different view of points. At present, to integrate urban and rural economic development, lay solid foundation for agricultural and rural development and promote new socialist countryside construction, the key and core problem is making every effort to increase farmers' income and to make farmers get rich. However, large rural population is a basic national condition of China. Although China has made outstanding achievements in solving three issues concerning rural areas, and realized stable increase of yield for 11 consecutive years, and comprehensive implementation of collective forest tenure reform, as well as rapid development of specialized farmer cooperatives [23]. Nevertheless, at the same time, various traditional and non-traditional challenges are increasing, the requirement for transforming agricultural development mode is higher and higher. the task for breaking urban and rural dual structure is heavier and heavier, and thus the difficulties in solving three issues concerning rural areas are more and more, the risks are increasing, environment is more complex and task is more arduous. For problems of increase of farmers' income, it is urgent to make in-depth theoretical and practical researches, to better and fast solve three issues concerning rural areas<sup>[24]</sup>.

Summarizing the above studies of many scholars, they mainly study growth of farmers' income from balance of agricultural development, social economic system, farmers' benefit protection, employment, and integration of urban and rural development at the macroscopic level, while there are few studies from administrative divisions such as counties at the microscopic level. These research findings lay theoretical and practical foundation for government at all levels, relevant departments, and scholars to further study the issue of increase of farmers' income. For certain administrative region of China, relevant entities should combine local realities to formulate pertinent policies. This is essential and inevitable requirement for building new socialist countryside, comprehensively building well-off society, and coordinating benign and sustainable development of national economy.

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(From page 80)

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