Analysis of Consumers' Trust in Imported Infant Milk Powder and Its Influencing Factors

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Abstract—**This paper took the trust degree of consumers to import infant milk powder safety as a dependent variable, took the consumer's age, education level, gender, marital status, fertility status, family income and other 12 factors as explanatory variables, analyzed the consumers' trust in imported infant milk powder and its influencing factors. 303 valid questionnaires were obtained by questionnaire, and the regression results were run by logistic method, and the conclusion was that most Chinese consumers held a high degree of trust in imported infant milk powder, and consumers ' age, education level, income, purchase channels, consumer safety awareness and other factors have a significant positive impact on the degree of trust.**

Keywords—Consumers; Imported infant milk powder; Level of trust

I. INTRODUCTION

In recent years, the safety of infant milk powder in China has been more serious, which has led many Chinese consumers to switch to the purchase of imported infant milk powder. And the level of trust of Chinese consumers in imported infant milk powder will affect the behavior of Chinese consumers to buy infant milk powder, and even the development of the entire infant milk powder industry chain will have an impact. As domestic milk powder safety problems are common, this let many consumers began to look at imported infant milk powder [1]. In recent years, China's imported milk powder scale shows a rapid growth trend, especially infant milk powder, the scale of growth is even more alarming [2]. The safety of infant milk powder is not only closely related to people's life, but also

involves the issue of food safety management. In fact, in recent years, China's attention to a number of food safety issues, has clearly put the issue of dairy safety in the first place, which is enough to show that the current government and many people attach great importance to it [3]. Therefore, it is of practical significance to analyze consumers 'trust in imported infant milk powder and influencing factors.

In this study, consumers over 18 years of age as the object of investigation, to the way of online investigation of the level of trust in imported infant milk powder. A total of 350 survey samples were issued, a total of 321 were recovered, the number of valid questionnaires was confirmed to be 303, and the effective recovery rate was 94.39%. Among them, the proportion of women in the consumer is relatively high, the ratio is 69.64%, the male share is 30.36%; In terms of age structure, the proportion of consumers aged 18-25 is the highest, followed by 26-35-year-old consumers, 46-55 years of age consumers are relatively low, the level of education, the largest number of undergraduate students, the share is 74.59%.

II. THE LEVEL OF TRUST OF CONSUMERS IN IMPORTED INFANT MILK POWDER

In order to analyze the degree of consumer's trust in the safety of imported infant milk powder, this paper investigates the quality and safety cognition, quality and safety satisfaction and quality and safety trust of consumers in imported infant milk powder, the concrete results are shown in table1.

TABLE I   LEVEL OF TRUST OF CONSUMERS IN IMPORTED INFANT MILK POWDER

Trust level	Options	Frequency	Percentage
tquality and safety cognition	Very dangerous	5	1.65%
	Relatively dangerous	15	4.95%
	Not sure	182	60.07%
	Relatively safe	98	32.34%
	Very safe	3	0.99%
quality and safety satisfaction	Very dissatisfied	12	3.96%
	Not very satisfied.	22	7.26%
	commonly	192	63.37%
	More satisfied	75	24.75%

Table I, cont			
	Very satisfied	2	0.66%
Quality and safety trust level	Distrust	7	2.31%
	Little trust	20	6.60%
	commonly	177	58.42%
	Comparative trust	95	31.35%
	Very trust	4	1.32%

According to the results of the survey, in terms of the level of food safety cognition of imported infant milk powder, 33.33% of the 303 effective questionnaires held a positive attitude, 60.07% of the respondents were neutral, and 6.6% of the respondents held a negative attitude; the quality and safety satisfaction of imported infant milk powder, of the 303 valid questionnaires, only 25.41% of the respondents were positive, 63.37% of the respondents were neutral, and 11.22% of the respondents said no; the results of the survey on Quality and safety trust of imported infant milk powder showed that 32.67% of valid questionnaires respondents had a positive attitude, 58.42% of respondents were neutral, and 8.91% of respondents had a negative attitude. The results show that, most Chinese consumers hold a high level of trust in imported infant milk powder.

III. ANALYSIS OF THE FACTORS INFLUENCING CONSUMERS ' TRUST IN IMPORTED INFANT MILK POWDER

A large number of previous studies have found that individual characteristic variables of consumers, such as age, will have different effects on consumers ' psychological process and attitude tendency, and will eventually affect consumers ' trust evaluation of imported infant milk powder [4]. Usually in consumption, the consumers ' acquisition and evaluation of knowledge will have an important impact on psychological activities, decision-making process. At the same time, consumer health awareness is also an important factor in consumer trust evaluation, some consumers pay more attention to environmental protection and health awareness, such consumers pay more attention to food safety certification [5].

Therefore, this study considers that individual characteristics, product knowledge and consumer attitude will affect the consumer's trust in imported infant milk powder, and specifically divided into 12 factors: age, education level, gender, marital status, fertility status, household income, consumer awareness, price, purchase channels, product origin, health awareness, Milk powder Safety Awareness [6].

Because the values of the interpreted variables in this study have a more obvious sort relationship, the logistic regression model is chosen to quantitatively analyze the factors of consumer trust evaluation. Combining the hypothesis of this paper, the trust model of consumer i is constructed:

$$\text{Trust}_i = \beta' x_i + \varepsilon_i \tag{1}$$

x_i is explanatory variables vector, $x_i' = (1, x_{i1}, x_{i2},\ldots, x_{ik})$;Beta is the regression coefficient vector, $\beta' = (\beta_0, \beta_1, \beta_2,\ldots, \beta_k)$ .In this study, consumer trust choices were used as proxy variables to measure consumer trust evaluation data for safe certified foods. The following conditions are true:

$$\begin{cases} Y_i = 0 & \text{if} \quad \text{Trust}_i \leq 0 \\ Y_i = 1 & \text{if} \quad 0 < \text{Trust}_i \leq \mu_1 \\ \ldots\ldots \\ Y_i = 4 & \text{if} \quad \mu_3 < \text{Trust}_i \leq \mu_4 \end{cases} \tag{2}$$

And, $Y_i = 0,1,2,3,4$,respectively, indicate the degree of trust from high to low,; μ_i is the tipping point, and, $0 < \mu_1 < \mu_2 < \mu_3 < \mu_4$ 。 It can be concluded that:

$$\begin{cases} \text{prob}(Y_i = 0) = 1 - F(\beta' x_i) \\ \text{prob}(Y_i = 1) = F(\mu_1 - \beta' x_i) = F(-\beta' x_i) \\ \ldots\ldots \\ \text{prob}(Y_i = 4) = 1 - F(\mu_4 - \beta' x_i) \end{cases} \tag{3}$$

And,

$$F(\beta' x_i) = \exp(\beta' x_i) / [1 + \exp(\beta' x_i)] \tag{4}$$

In order to study the change of consumer trust level in depth, this study takes the marginal effect to measure the degree to which the change of consumer characteristic variable affects the level of trust, and the expression formula is as:

$$\begin{cases} \partial \text{prob}(Y_i = 0) / \partial x_j = -f(-\beta' x_i) \beta_j \\ \partial \text{prob}(Y_i = 1) / \partial x_j = (f(\mu_1 - \beta' x_i) - f(-\beta' x_i)) \beta_j \\ \ldots\ldots \\ \partial \text{prob}(Y_i = 4) / \partial x_j = f(\mu_4 - \beta' x_i) \beta_j \end{cases} \tag{5}$$

In general, virtual variables are difficult to calculate by calculating the marginal effect of conventional continuous variables. Therefore, in this study, in the calculation of the marginal effect of virtual variables, variables other than the exclusion of the variable are treated as zero and calculated according to the formula (6), in which C is a constant entry:

$$E[Y \mid X_{ik} = 1] - E[Y \mid X_{ik} = 0] = F(c + X_{ik}) - F(c) \quad (6)$$

The regression analysis results of consumers' influence factors on the quality and safety trust of imported infant milk powder are shown in the following table:

TABLE II   ORDERED LOGISTICS REGRESSION RESULTS

variable		coef	Std.Error	Z Statistic	P
Explanatory variable	Age	0.03	0.00611	5.14603	0.00000
	Education level	0.04	0.01823	2.26574	0.01461
	Gender	0.04	0.07794	0.52658	0.53782
	Marital status	0.01	0.12231	0.10211	0.85549
	Fertility status	-	0.09032	-0.56864	0.50943
	Family income	0.01	0.01341	1.21269	0.18314
	Consumer cognition	0.09	0.08402	0.23130	0.23130
	Price	0.11	0.09962	0.24319	0.24291
	Buying channel	-	0.09395	0.00000	0.00000
	Product origin	0.09	0.08120	1.09325	0.22783
	Health consciousness	0.09	0.07726	1.09624	0.22661
	Milk powder safety	0.20	0.08575	2.24139	0.01564
critical point	LIMIT	0.62	0.39057	1.55913	0.00836
	LIMIT	0.14	0.39233	3.56616	0.00019
	LIMIT	2.36	0.39651	5.80181	0.00000

According to Formula (5), formula (6), the marginal effect of independent variables on consumer trust is calculated in table3.

TABLE III   MARGINAL EFFECT OF INDEPENDENT VARIABLES ON THE DEGREE OF CONSUMER TRUST

independent variable	prob(Yi=0)	prob(Yi=1)	prob(Yi=2)	prob(Yi=3)	prob(Yi=4)
Age	-0.00804	0.00268	0.00278	0.00189	0.00079
Education level	-0.01063	0.00348	0.00367	0.00258	0.00099
Gender	-0.01053	0.00348	0.00358	0.00248	0.00099
Marital status	-0.00318	0.00109	0.00109	0.00079	0.00030
Fertility status	0.01301	-0.00437	-0.00437	-0.00298	-0.00119
Family income	-0.00417	0.00139	0.00139	0.00099	0.00040
Consumer cognition	-0.02364	0.00755	0.00814	0.00576	0.00228
Price	-0.02741	0.00874	0.00943	0.00665	0.00258
Buying channel	0.10805	-0.04102	-0.03565	-0.02284	-0.00854
Product origin	-0.02304	0.00735	0.00785	0.00556	0.00218
Health consciousness	-0.02195	0.00705	0.00755	0.00526	0.00209
Milk powder safety awareness	-0.05065	0.01549	0.01748	0.01261	0.00497

An analysis of the model measurement results in table 4 leads to the following conclusions: (1) When yi=0, the marginal effect of age, income and continuous variables of educational level is negative, indicating that the increase in age, the level of education and the increase in income, consumer "distrust" of imported infant milk powder is less likely. In a deeper analysis, it was found that when yi>0, the increase in age, income and education, consumers were most likely to have a "general" trust

in the import of infant milk powder. (2) When yi=0, the marginal effect of discrete variables of gender, marriage, cognition, origin, price evaluation, health awareness and milk powder safety consciousness is negative, indicating that consumers with the characteristics of the above variables have a higher level of "trust" in imported infant milk powder than consumers with non-variable characteristics (reference group). In Yi>0, with the exception of marriage variables, the marginal effects of the above variables are yi=2 (general), Yi=1 (less trusted), Yi=4 (very trusting), Yi=3 (Comparative trust), indicating that consumers with the above characteristics except marriage are compared with the consumers of the reference group, their trust in imported infant milk powder is more likely to be "average". Marriage variables, when Yi=1 and yi=2, the marginal effect is equal, greater than the marginal effect of yi=3 and yi=4, indicating that the level of trust of married consumers in milk powder is more biased towards "general" and "less trust." (3) under the condition of yi=0, the marginal effect of family structure and purchase convenience is positive, which shows that consumers with the characteristics of the above variables are more inclined to "very distrustful" of the trust of imported infant milk powder, and under the condition of yi>0, the marginal effect of family structure and purchase convenience is negative. Among them, the family structure in Yi=1 and yi=2, the marginal effect is equal, and higher than other levels of trust, indicating that there are no children of the family, the consumer's trust in the import of infant milk powder is more biased towards "less trust" or "general", and consumers with the characteristics of purchasing convenience have a greater degree of trust in imported infant milk powder "Not very trusting." In the results of marginal effect analysis, it can be found that different variables have different influence on the trust degree of consumers.

IV. CONCLUSIONS

The findings of this paper show that most Chinese consumers hold a high degree of trust in imported infant milk powder, and that factors such as age, education level, income, purchase channels and consumer safety awareness of consumers have a significant positive impact on the level of trust. And that the increase in age, educational attainment and income of consumers, the higher the trust of consumers in imported infant milk powder; The more the trust of married consumers in milk powder is more in favor of "general" and "less trust"; And the level of trust of consumers in imported infant milk powder is more biased towards "less trust" or "general" than that of families without children; Consumers with the convenience of purchasing have a greater degree of trust in the import of infant milk powder than "less trust". In a word, there are significant differences in the degree of trust between consumer groups with different characteristics.

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