

## Research Article

### Research on College Students' Safety Awareness and Behavior in Food Consumption: an Empirical Study based on the College Students in Suzhou

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**Abstract:** In recent years, china's social parties gave high attention to the issue of food safety; however, the food safety situation is not optimistic in colleges and universities. In this study, we test the factors that affect college students' safety awareness and behavior in food consumption and conclude four main indicators as food safety attitude, consciousness of rights safeguarding, processing method and knowledge learning. The result shows that food safety attitude is the most important factor that effect college students' safety awareness and behavior. According to the consciousness of rights safeguarding, most students will choose complaints to business or do not handle. Also, the processing method shows that most students will choose take some medicine or have a rest, instead of going to the hospital to check. So that, colleges should make full use of existing resources and conditions, then promote food safety.

**Keywords:** College student, food consumption, food safety, influencing factors

## INTRODUCTION

At present, standardization and socialization of food safety supervision in China is still in its beginning; social supervision mode of food safety in developed countries has not yet formed a similar (Zhou and Geng, 2002). In this context, China's academic research on consumer food safety knowledge attitude and behavior status is more to specific consumer groups as the research object. Among them, as a special consumer group of students in Colleges and universities, their food safety knowledge attitude and behavior status has been studied widely and deeply.

Through the long-term effective practice, the developed countries have established a relatively perfect food safety social supervisor mode, thus forming a wide coverage; improve the management of food safety supervision network in the whole society (Lydia and Virginia, 2001). In this context, the academic research in developed countries on consumer food safety knowledge attitude and behavior status is not to carry out investigation and research for specific consumer groups, compartmentalized (Worsfold and Griffith, 1997) and more from the food safety knowledge attitude and behavior status of the whole social consumer as the research content, from a macro level consumer to a certain period of time food safety knowledge attitude and behavior investigation. Different national conditions and development stage, the domestic and foreign academic research of food safety knowledge attitude and behavior of consumers emphasis and focus are also different (Zhi and Yan, 2008 and Zhou, 2013), this kind of research of

academic circles in developed countries is mainly aimed at the situation of food safety knowledge attitude and behavior of the whole society of consumers, not the query to the research on food safety knowledge attitude and behavior status specifically for college students.

Research on consumer food safety knowledge attitude behavior of foreign academic circles is a relatively mature. USA early in the last century eighty's to carry out the related research about the impact of consumer food hygiene knowledge and behavior of food borne diseases (Walter and Cohen, 1997), since the ninety's of the last century, such an investigation has been conducted in most parts of the country. These investigations show, making food regulations for the United States government and provides scientific basis for the development of the national food safety education (Bolton and Meally, 2008; Li and Ning, 2012). The survey of consumer food safety knowledge, involve wide, but in a few years of investigation, knowledge is mainly focused on food borne diseases and prevention. Since twenty-first Century, the United States conducted a new survey on food safety, consumer attitudes and behavior found that 91% of the respondents believed that the issue of food safety is very important (Wachenheim and Beauchamp, 2013), 27% of the people think that food processing errors and poor personal hygiene is the most important cause of food borne disease occurrence. The same is the result of the survey from the United States, 70% of the respondents believed that produce their own food approach is correct, 28% of the people think that is caused due to the family diet food borne disease is extremely common or prevalent.

Sun and Li (2007) selected part of the college students in Jining city food safety knowledge, attitude and behavior in questionnaires, according to the results of the survey, food safety knowledge scores than the students of medical college students of non medical college; College of food safety consciousness is strong, have good diet habits, but there are also some bad diet behavior. Liang and Liu (2008) conducted a questionnaire survey on the part of the college students in Guangzhou city in the "investigation" of college students in Guangzhou city food safety knowledge attitude behavior, according to the results of the survey, Guangzhou city food safety among college students in lower knowledge scores, television and radio is the main way for college students to acquire the information of food safety. Food safety attitude more positive most of the college students (Zhang and Chen, 2012), willing to accept more food safety knowledge, but the choice of where to buy and the food consumption in food of college students has some bad behavior. Tian (2010) in the "KAP" food safety among college students in the investigation and analysis of food safety KAP survey of 630 college students in a university, the results show the food safety knowledge scores of college students is relatively low, Journal of family and friends has become a major way for college students to acquire the knowledge of food safety, has been involved in the food hygiene related lectures students score higher, the majority of college students there are still bad dietary behavior of different degree. Yin and Xu (2010) in the "850 college students in Kunming city food safety knowledge, attitude and behavior survey in Kunming city" on the part of students of food safety knowledge attitude behavior condition to carry on the questionnaire survey, the survey results show that the food safety knowledge, students with low scores; the school has influence on food safety knowledge scores, there is statistically significant differences between medical and non-medical students the knowledge of food safety, medical students scored higher than non medical students; grade have influence on food safety knowledge scores (Ning and Li, 2013), grade four or five students to understand the food safety knowledge of more than two or three students; television broadcasting is the main way for college students to obtain information on food safety and food safety knowledge; attitude most college students better, to obtain more food safety knowledge, but in the purchase of food places and consumer self-protection aspects exist some bad behavior.

In addition, Zhu and Su (2012) in the food safety among college students in Nanchong investigation and analysis of KAP food safety questionnaire survey was carried out in part of the college students in Nanchong City University and statistical analysis, the results showed the students the knowledge of food safety knowledge rate is not high, most of the students the

desire to acquire more food safety knowledge, television, network, newspapers and magazines around people and is the main channel for students to achieve food security information in the purchase of food, but there are some bad behavior and consumer awareness of self-protection is relatively low (Zhou, 2013; Qing and Li, 2014). Based on this result, strengthen the propaganda and education of school food safety knowledge the author suggests that colleges and universities and to popularize the knowledge of food safety law, causes it to obtain a more comprehensive and timely food safety knowledge, improve bad dietary behavior and habits.

Based on the above studies in domestic academic circles on the food safety knowledge attitude and behavior of college students can be seen, the domestic academic circles show such studies are using the method of questionnaire investigation results are obtained at first hand (Zhang and Chen, 2013; Li, 2014). According to the actual research needs to use the method of statistical analysis for the specific analysis of the survey results and finally puts forward relevant countermeasures and suggestions according to the conclusions of the analysis. However, the research of present situation, the domestic academic circles most of these studies are limited to using the method of questionnaire, individual interviews for research object is the relative lack. Moreover, most of these studies are only limited to the situation of food safety knowledge attitude and behavior investigation and analysis of the local college students, high school students and the factors affecting food safety knowledge attitude behavior also involves less, the suggestions are macro, in the detail aspect still needs improvement.

### MODEL DESIGE AND STATISTICAL ANALYSIS

**Model design:** For the Factor analysis, R characteristic equation of a matrix is  $|R-\lambda|$ , assuming that their p eigenvalues satisfy the following relations:  $\lambda_1 > \lambda_2 > \dots > \lambda_p \geq 0$ , the eigenvectors corresponding is  $U_1, U_2, \dots, U_p$  and each feature vector as a column vector of matrix:

$$U = [U_1, U_2, \dots, U_p] = \begin{bmatrix} U_{11} & U_{12} & \dots & U_{1n} \\ U_{21} & U_{22} & \dots & U_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ U_{p1} & U_{p2} & \dots & U_{pn} \end{bmatrix} \quad (1)$$

Let  $F = U'X$ , then the above formula becomes:

$$FF' = \Lambda = \begin{bmatrix} \lambda_{11} & & & 0 \\ & \lambda_{22} & & \\ & & \ddots & \\ 0 & & & \lambda_{pn} \end{bmatrix} \quad (2)$$

Table 1: Professional types

Professional types	Food safety and related major	Others
Number	404	650
Percentage %	38.33%	61.67%

Table 2: Grade classification

Grade	Low grades	High grade
Number	638	416
Percentage %	60.53%	39.46%

Table 3: Gender

Gender	Male	Female
Number	448	606
Percentage %	42.50%	57.50%

After the simplification, we obtain:

$$F = [U'x_1, U'x_2, \dots, U'x_n] \quad (3)$$

The  $F_a = U'Xa$  ( $\alpha = 1, 2, \dots, n$ ) and every  $F_a$  can be considered as sample observation value of main factor, which can be written as:

$$F_a = [f_{1a}, f_{2a}, \dots, f_{pa}] \quad (4)$$

Because  $F_a = U'Xa$ , then we can get  $Xa = Ufa$ :

$$X_a = [U_1, \dots, U_m, U_{m+1}, \dots, U_p] \cdot \begin{bmatrix} f_{1a} \\ \vdots \\ f_{pa} \end{bmatrix} \quad (5)$$

**Data source:** The empirical research uses the method of questionnaire investigation to obtain the main contents of the study required and with individual interviews of college students as the assistant. Author to the professional type as the layering principle, a total of 24 classes using stratified random cluster sampling in Suzhou college students as a sample of empirical studies conducted a questionnaire survey, 1200 questionnaires were distributed, according to these statistics, the effective recovery of 1054 questionnaires, effective recovery rate 87.3%.

**The basic statistical analysis of sample:** The empirical research of this study mainly is the use of questionnaires and interviews of the two methods. Among them, the interview method is the supplementary questionnaire survey method. In the interview, the author selects interview objects are from Suzhou College, due to specialization, the author of food safety related professional students pay more attention to the individual interview. Of course, the empirical study the most basic method or the method of questionnaire investigation, therefore, here an empirical study on the basic situation of the inductive samples specified by cluster random sampling method was used to extract the effective recovery of the questionnaire

and the basic situation of the sample of students. According to the sampling methods, the author will food specialty of law major and collectively known as the food safety related major. The statistical results of the data, the food safety related professional 404 students, the total samples of 38.33%; other professional 650 students, 61.67% of the total samples, as show in Table 1.

Analysis for the statistical data conveniently, the second grade are collectively referred to as the low grade, the three, the fourth grade are collectively referred to as the high grade. The statistical results of the data, the lower grade students 638 people, accounted for 60.53% of the total number of samples; high grade students 416 people, accounted for 39.46% of the total number of samples. Because the SZ college as new professional school, so the number of low grade students is more than the high school students, as shown in Table 2.

From the gender perspective, the statistical results of the data, the male student 448 people, accounted for 42.50% of the total number of samples; female students 606 people, accounting for 57.50% of the total number of samples. As shown in Table 3.

## RESULTS AND DISCUSSION

**Food safety situation in higher education institutions:** According to the statistic analysis of food safety related courses or publicity and education activities to participate in. The statistical results of the data, select "yes" student 103 people, accounting for 9.77% of the total number of samples; select "no" student 951 people, the total samples 90,22%. From the survey results, the majority of college students are not systematically participated in the food safety law related courses or activities of propaganda and education. As shown in Table 4.

Due to the lack of systematic "food safety law" the relevant courses or activities of propaganda and education, college students often only through other channels to obtain knowledge and information, which related to food safety, network plays a very important role. At present, the network has been widely popular among the students in Colleges and universities, the network has a large amount of information, dissemination speed and real-time information advantages and thus become college students to obtain food safety related knowledge and information is the most convenient method. On the one hand, provide favorable conditions for the popularization of the internet for the food safety knowledge, the dissemination of information in university students. But, on the other hand, the information on the network is complex, there are much non rational, not scientific, authoritative information, it is easy to cause many misunderstandings of college students in the field of

Table 4: Food safety related courses and education activities

Whether involved in related courses	Yes	No
Number	103	951
Percentage %	9.77%	90.22%

Table 5: The way to understand the food safety law and the related knowledge

Way	Number	Percentage (%)	Ranking
Network search, online learning	876	83.11	1
TV, radio	526	49.90	2
Family, friends, classmates	475	45.05	3
Books, newspapers, Food safety law and education courses	292	27.7	4
Others	38	3.60	5
	12	1.13	6

Table 6: The degree of attention to food security

The degree of attention to food security	Never	Occasional attention	General	Concern	Very concerned
Number	45	151	412	228	118
Percentage %	4.26%	14.32%	39.08%	21.63%	11.19%

Table 7: Evaluation of the current food security situation

Current food security situation	Very poor	Poor	General	Better	Very good
Number	155	435	360	104	0
Percentage %	14.7%	41.27%	34.15%	9.86%	0%

Table 8: KMO statistical test and Bartlett test

Bartlett test	Kaiser-Meyer-Olkin	0.756
	Approximate chi-square	143.281
	df	35
	Sig.	0.000

food safety. Therefore, the statistical results reflect the food safety publicity and education of college students missing problem is indeed worthy of reflection.

At the same time, we get to college students' sources of food safety law and the related knowledge of statistics, the statistical results of the data, select "network" 876 people, ranking the first; the choice of "TV, radio" 526 people, ranking second; choose "family, friends, classmates and other people around me" are 475 people, ranking third; select "books, newspapers and other print media" 292 people, ranking fourth; select "Food safety law and education courses" are 38 people, ranking fifth. As shown in Table 5. As can be seen, the network has become the main way for college students to understand the "food safety law" and related knowledge. As mentioned earlier, the network in university students for college students to understand the popularization of "food safety law" and the related knowledge and provides a convenient, but, because of the complexity of network information, some of which are not authoritative information is also very easy to mislead the high school students. College students to understand "the other two major ways of the food safety law" and related knowledge is a television, radio and the family, friends, classmates and other people around

him. From the statistical results, has been far less than books, newspapers and other print media play a role in this regard the three main ways. The more notable is, only a very small number of university students is through the "food safety law" the relevant courses or publicity and education activities to understand the "food safety law" and related knowledge. Compared to the other four ways, through the "food safety law" the relevant courses or publicity and education activities to obtain food safety knowledge, information tends to be more professional, more system.

**The degree of attention to food security:** The statistical result data, 45 students select the "never pay attention", accounted for 4.26% of the total number of samples; 151 students select "basic do not focus on the", accounted for 14.32%; 412 students select "general", accounted for 39.08%; 228 students select "concern", accounting for 21.63%; 412 students select "very concerned", accounting for 11.19%. From the statistical results, college students to pay close attention to food safety are very high. As shown in Table 6. As mentioned above, our overall social parties on food safety has been paid much attention, in this context, college students' high attention to food safety is also reasonable. College students are relatively the educated to degree level and belongs to the young people, therefore, they come in contact with all sorts of food safety information more easily through the Internet and other new media, a series of food safety incidents in China in recent years has had great influence among college students. Moreover, because the university students more pursuit of high quality life style, so they will pay more attention to food safety issues, more sensitive. The statistical results of this data also confirmed that the college students' attention on food safety.

**China's current food security situation evaluation:**

The statistical results of the data shows that 155 students select the "very poor", accounted for 14.7%; 435 students select "poor", accounted for 41.27%; 360 students select the "general", accounted for 34.15%; 104 students select "better", accounting for 9.86%; and no students select "very good". From the statistical results, the vast majority of college students hold negative evaluation on China's current situation of food safety. As shown in Table 6. As can be seen, in recent years, along with our country a series of food safety incidents have occurred and the dawn, our country public doubts about China's food security situation grow with each passing day; therefore, hold a negative evaluation on China's current food security situation and a few people (Table 7).

**Factor analysis:** According to the previous research, we conclude four indicators which affect the college students' safety awareness and behavior in food

Table 9: Result of load parameter

Indicators	Secondary indicators	Factor loadings	Symbol
Food safety attitude $\beta_1$	Shelf life	0.865	X1
	Storage conditions	0.840	X3
	Additive	0.785	X2
Consciousness of rights safeguarding $\beta_2$	Complaints to business	0.891	X4
	Complaints to the Consumer Association	0.813	X5
	Do not handle	0.827	X7
	Complaints to the food safety supervision department	0.725	X6
Processing method $\beta_3$	They eat some medicine	0.813	X8
	Have a rest, wait for disease of self improvement	0.784	X10
	Go to the hospital to check	0.671	X9
Knowledge learning $\beta_4$	Participate in the activities of propaganda and education	0.642	X12
	Study of the food safety law	0.728	X11
	Learning related courses	0.656	X13
	Self learning	0.693	X14

consumption. The four indicators are food safety attitude, Consciousness of rights safeguarding, Processing method and Knowledge learning. According to these four indicators, we analyze 14 secondary indicators which are consistent with the main four indicators. In order to analyze and process the data of questionnaire, we use factor analysis. First, we using KMO test and Bartlett test to determine whether the data is suitable for factor analysis or not, as showed in Table 8. The result shows that the test value of KMO is 0.756 and p value of Bartlett test is less than 0.05, which illustrates that the data of the network learning resources is suitable for factor analysis. Then we made standardized processing of factor loading, as shown in Table 9, after the standardized processing of factor loading, we find the load is between 0.65 and 0.89, which means credibility of measurement scale is relatively high. From the result, we can get that food safety attitude is the most important factor that effect college students' safety awareness and behavior in food consumption; most student will notice the shelf life, storage conditions and additive when in food consumption. Consciousness of rights safeguarding is the second factor that will affect college students' safety awareness and behavior in food consumption, most students will make complaints to business or do not handle. Also, the processing method is the third factor and most student will choose take some medicine or have a rest, instead of going to the hospital to check.

### CONCLUSION

The result of statistical analysis shows that college students' knowledge of food safety situation is not optimistic attitude behavior. The grading standards of food safety knowledge, attitudes, behavior level and the overall level of food safety knowledge attitude behavior three aspects of theory, compared to the highest total score of university students in the three aspects of scores are relatively low. First, food safety attitude is the most important factor that effect college students'

safety awareness and behavior in food consumption; most students will notice the shelf life, storage conditions and additive when in food consumption. Consciousness of rights safeguarding is the second factor that will affect college students' safety awareness and behavior in food consumption, most students will make complaints to business or do not handle. Also, the processing method is the third factor and most student will choose take some medicine or have a rest, instead of going to the hospital to check. Lack of food safety publicity and education of the college students appear this kind of circumstance and not unrelated. As mentioned earlier, all the time since, the extent of our university and attention on food safety publicity and education are still far from enough, lacking in food safety publicity and education of College students. This led to a lack of most college students are often unable to systematically understand the knowledge of food safety science, authority, at the same time in food safety attitude behavior can easily misguided.

As mentioned, the propaganda of food safety education of college students have very high expectations, but the university student schoolwork burden is relatively light, the spare time is abundant, which for our college students' food safety publicity and education system to create an important objective and subjective conditions. The present stage food safety publicity and education work of college students need to work together and practice of University and college students themselves two aspects.

Colleges and universities should make full use of existing resources and conditions to promote food safety course design and improvement for the universities, set up food safety course is an effective way of College Students' food safety knowledge attitude behavior and raising the level of the present stage. In recent years: to our country social parties gave high attention to the issue of food safety, College of course is not exceptional also, colleges and universities as our social knowledge resources and intellectual resources are highly accumulated and concentrated place, in the food safety problem of the breadth and

depth of the research on has obvious advantages, so in the academic have completely substance basic food safety of elective courses. More importantly, most universities have interactive communication platform between the relatively mature, can expand the real-time sharing of resources and academic exchange on the latest situation and development trend of food safety, so that you can quickly, safely to realize the food safety of elective courses set up and perfect. In addition, University as an important place of imparting knowledge has rich experience in curriculum design and improvement.

College students should be more actively involved in the food safety publicity and education to. Active participation in the improvement of college students' level of food safety knowledge attitude behavior inevitably cannot do without the majority of college students and the food safety publicity and education development also need to mobilize the enthusiasm and creativity of college students, so as to achieve the sound development of the food safety publicity and education of College students. The empirical study results show that, for college students to obtain knowledge of food safety in the way of showing a variety of situation and this one play the role of the network is particularly prominent, therefore, the practice of our food safety publicity and education in the college students should pay attention to in the relevant way to acquire the knowledge of food safety with college students, especially to give full play to the positive role of the network.

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