

**Research on public trust in bulk food supervision and sampling inspection  
from the perspective of network public opinion**

Gu Chenmeng、 Gao Jian and Cheng Jingmin\*

*Department of Management, Shanxi Medical University, Taiyuan City, China;*

\*Corresponding author: Cheng Jingmin, E-mail:chengjingmin@163.com

About the author: Gu Chenmeng (2002.05.21- -), female, master student, research  
direction: Public health and health communication.

## **Research on public trust in bulk food supervision and sampling inspection from the perspective of network public opinion**

**Abstract :** From the perspective of online public opinion, this paper analyzes the trust of Chinese consumers in bulk food safety supervision and sampling inspection from the three dimensions of emotion, attitude and values. It finds that netizens are very concerned about the current situation of bulk food supervision and sampling inspection, and the high qualified rate of bulk food is difficult to translate into subjective security accordingly. Based on the analysis of the supervision and sampling inspection status of bulk food in China from 2016 to 2020 on Sina Weibo and Toutiao, a trust evaluation model of the qualified rate of the supervision and sampling inspection is constructed. It is believed that the netizens' attitude and trust of the supervision and sampling inspection is increasing year by year, while their feelings and values are low. It is mainly influenced by the supervision and sampling work itself, the public itself, media, social environment and background. In this regard, the corresponding suggestions are put forward.

**Key Words:** Network public opinion; Sentiment analysis; Food safety; Supervision and sampling inspection; Trust assessment model;

## Introduction

Food safety is a major livelihood issue, which is related to the people's health and life safety, and is related to social harmony and stability. From 2016 to 2021, the sampling inspection qualified rate of bulk food safety supervision was 97.6%, 97.6%, 97.6%, 97.6% respectively, 97.69%, 98.22%, thus, the objective food safety situation overall steady in the positive [1], but in recent years our country a number of food safety cognitive survey results show the public of food subjective safety and cognition is not with food sampling pass synchronization, therefore, consumers lack of confidence and trust has become a new pain points of food safety.

Currently in the field of food safety research, many scholars research trust assessment to "food category [2,3,4], food industry [5], food safety stakeholders trust [6], food safety information [7]" is given priority to, the evaluation method has been given priority to with social investigation, and more of the traditional offline survey [8], few people assess the trust in the field of food safety sampling [9,13,14,15], and capture network big data evaluation research is few [11,12], and in the exploratory stage, there is no unified assessment method.

In 2021, the national "14th Five-Year Plan" once again proposed to "strengthen food safety supervision and sampling inspection" [10]. In this context, this study combined with supervision and sampling industry data analysis and research work, using the unique advantages of big data technology, explore the supervision based on network data qualified rate of trust evaluation model, analysis of the trust of food supervision and sampling work related, influencing factors and the main obstacles,

can effectively mining trust barriers, explore the trust promotion path.

## ***1 Main method***

Using the big data analysis methods of network text mining, text tendency analysis and word frequency analysis, and combined with the evaluation of the Haina network public opinion monitoring system V2.0, the food safety risk communication system V2.0, and the Dictionary of the Chinese system.

### *1.1 Data source and preprocessing*

The Haina Network public opinion monitoring system V2.0 was used to collect, clean and standardize about 120,000 data of bulk food during 2016-2020. Using the V2.0 platform of the food safety risk communication system, the trust tendency of netizens is identified based on the Chinese series of dictionaries and knowledge base.

The degree of trust is evaluated based on the comment data of netizens reflecting the emotion, attitude and values of trust. The calculation formula of "trust" is as follows: quantifying the level of trust in the form of percentage: the degree of trust, namely "the proportion of trust" = the expression of trust / the total amount of expression related to trust; the degree of distrust, namely = the proportion of expression of distrust / the total amount of expression related to trust; the proportion of trust in an evaluation dimension-the proportion of expression of confidence.

### *1.2 Construct the trust evaluation model of supervision and sampling inspection pass rate*

In the context of big data, the analysis of online public opinion starts from data collection. The steps of the analysis of online public opinion on food safety can be

divided into text emotion analysis, word frequency analysis and theme modeling of all online public opinion data (see Figure 1).

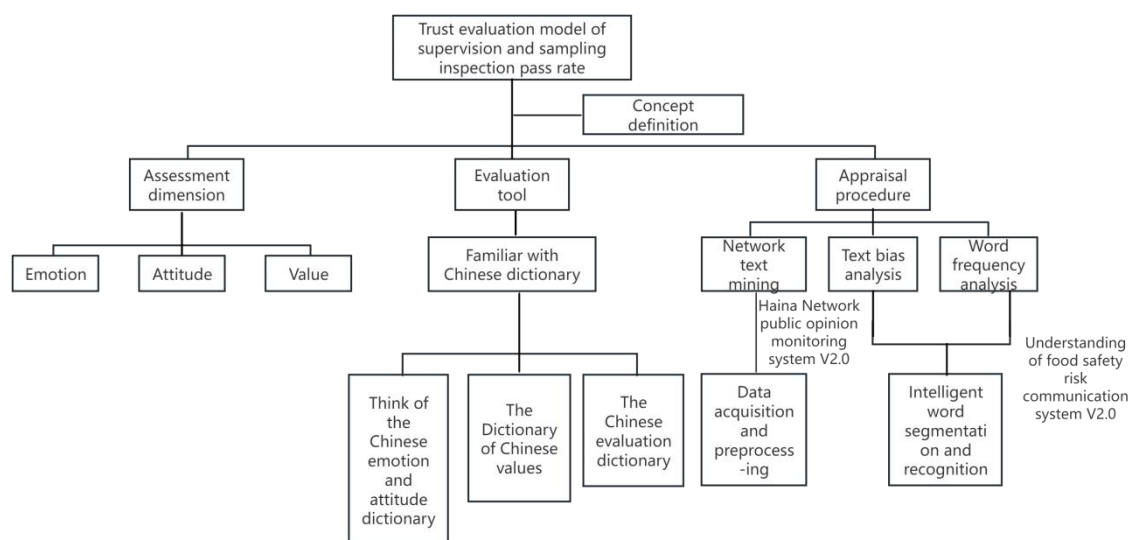


Figure 1 Trust evaluation model of qualified rate of supervision and sampling inspection

## 2 Results

### 2.1 Trust status of emotion, attitude and values

**2.1.1 emotional trust degree.** During 2016-2020, the public's emotional trust in the sampling results of bulk food was generally low. From the annual change trend, the emotional trust in 2016 and 2019 was relatively high, and the distrust emotion always occupied a large proportion. In 2018, the emotional trust was the lowest, with-36% (see Figure 2). During the five-year period, the public expression of trust was mainly "happiness, sadness and fear" (see Figure 3), while the expression of distrust was mainly "doubt" (see Figure 4).

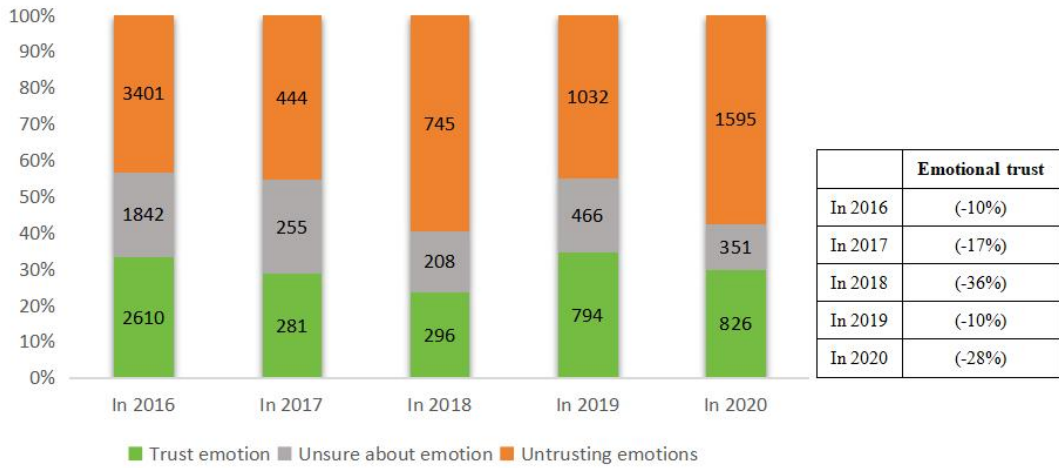


Figure 2 Annual trends of public emotional trust in the results of bulk food sampling tests

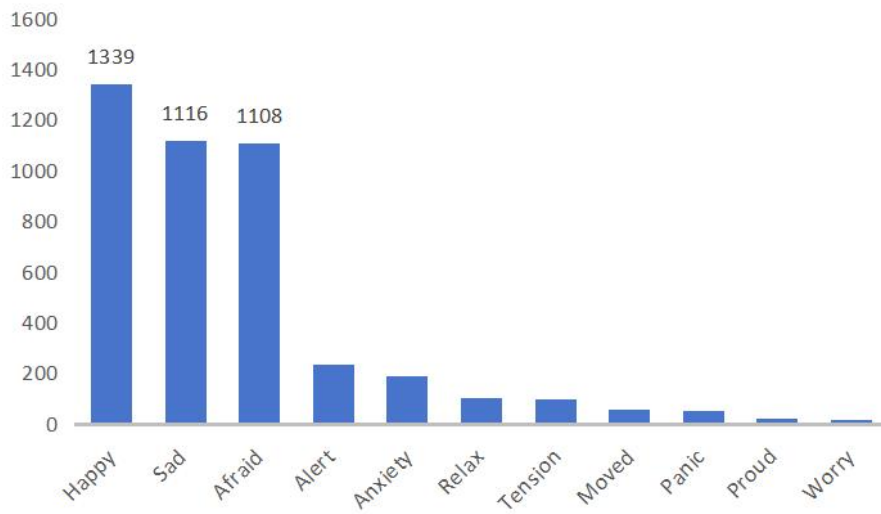


Figure 3 From 2016 to 2020, netizens trust the specific distribution of the sampling results

of bulk food

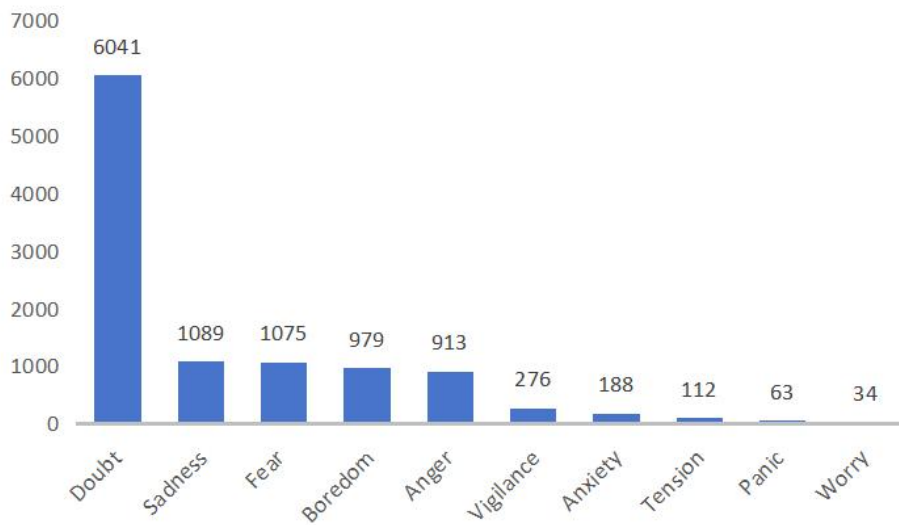


Figure 4 From 2016 to 2020, netizens did not trust the specific distribution of the sampling

results of bulk food

**2.1.2 Attitude and trust.** From 2016 to 2020, the public's attitude and trust towards the results of bulk food sampling was gradually increasing, with the lowest in 2016, the trust was 13% (see Figure 5). During the five years, the public's trust in the results of bulk food was mainly "praise" (see Figure 6), while the distrust was mainly "derogatory".(See Figure 7).

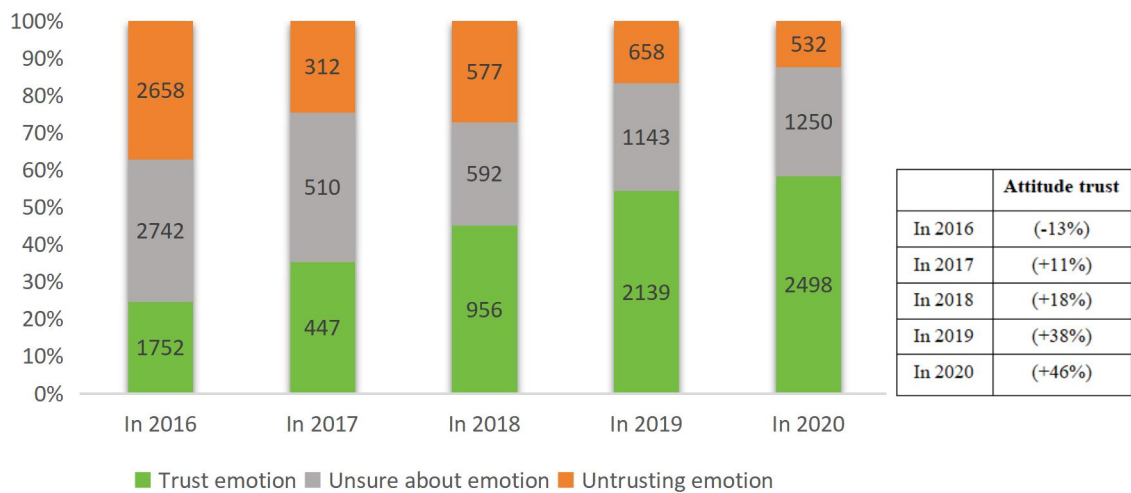


Figure 5 Annual trends of public trust in attitudes towards sampling results of bulk food

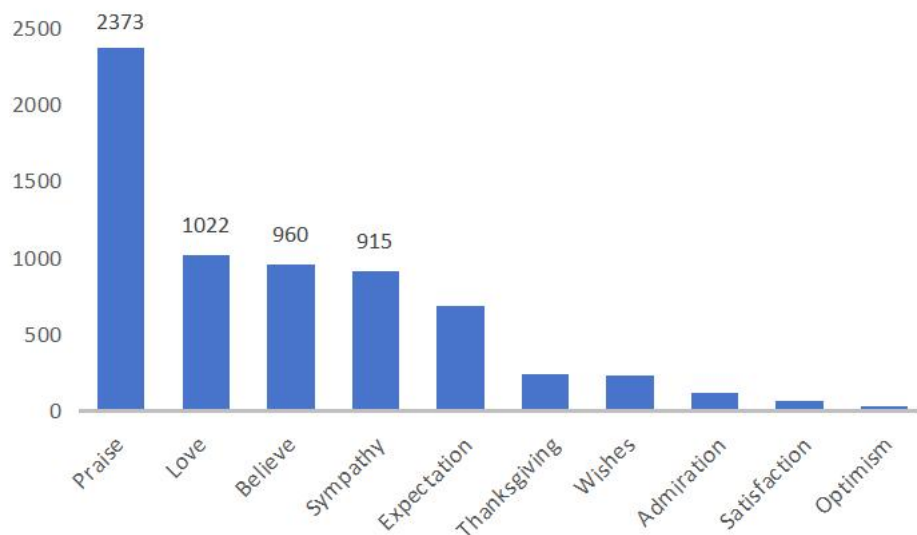


Figure 6 From 2016 to 2020, netizens will trust the results of bulk food sampling inspection

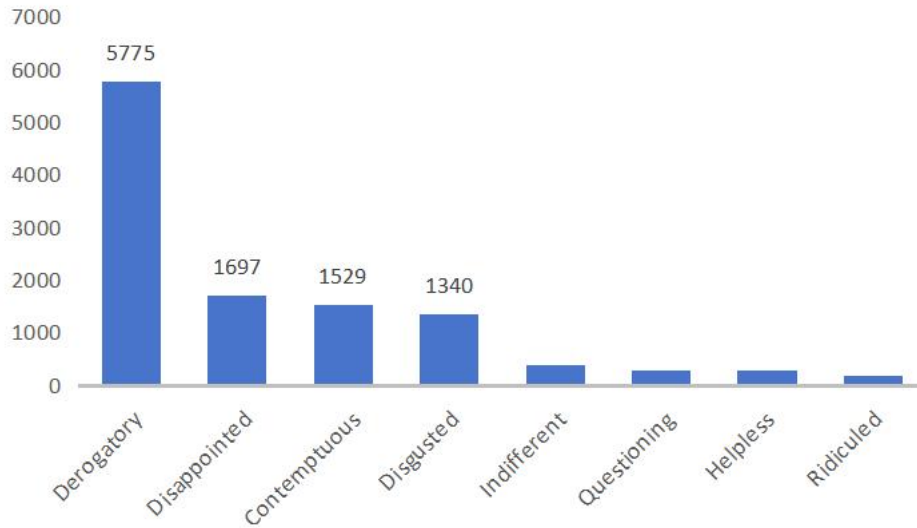


Figure 7 From 2016 to 2020, netizens showed distrust of the results of bulk food

**2.1.3 Value trust.** From 2016 to 2020, the public's trust in the sampling results of bulk food was not high. In 2016, the trust in values was the lowest, with -16%. In 2017 and 2019, the public trust in the sampling results of bulk food was high, with 12% and 8% respectively (see Figure 8). In terms of specific directional factors, the public trust values in the five years mainly point to "law-abiding conformity" and "public interest" (see Figure 9), while the distrust values mainly point to "character self-discipline" and "public interest" (see Figure 10).

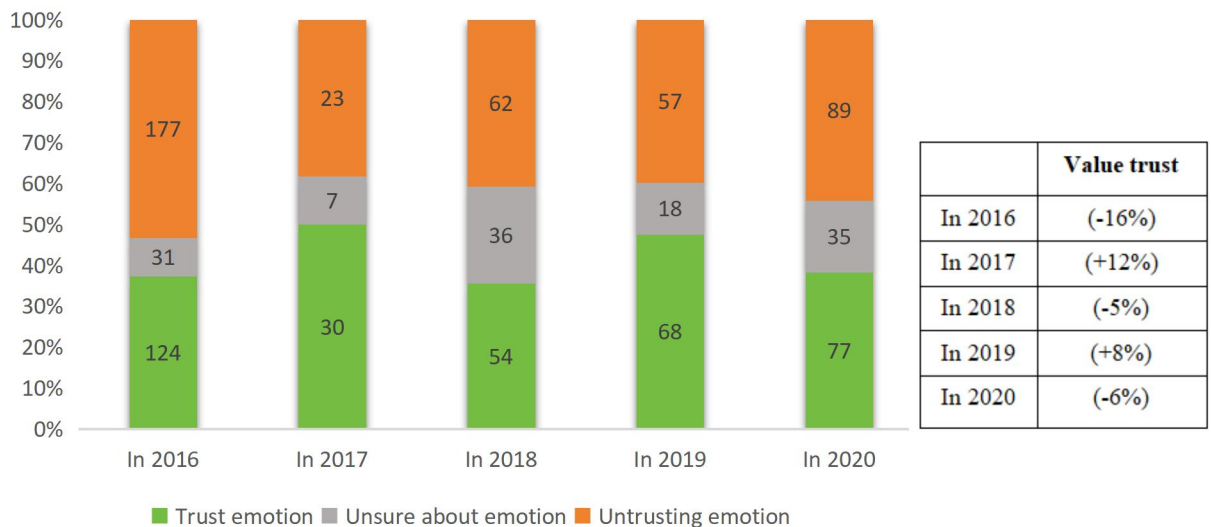


Figure 8 Netizens trust the annual trend of the results of bulk food sampling values



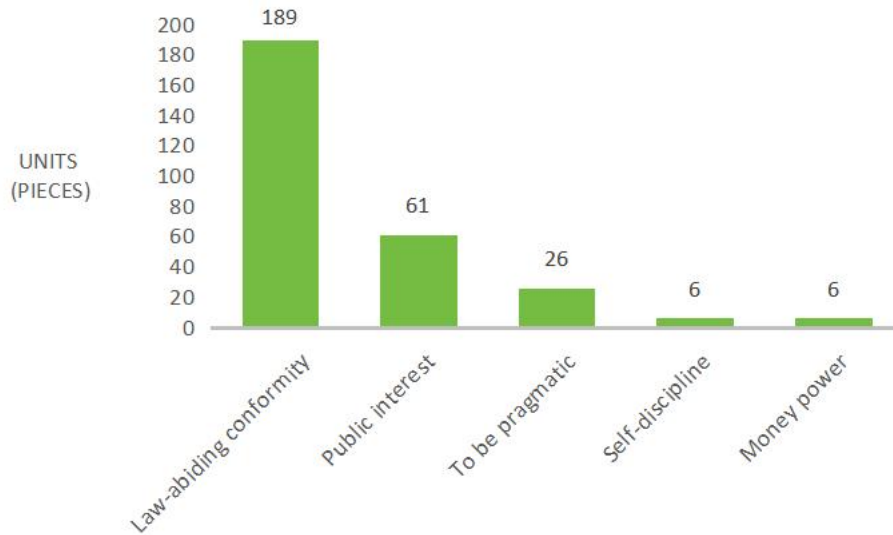


Figure 9 From 2016 to 2020, netizens will trust the values of the sampling results of bulk food

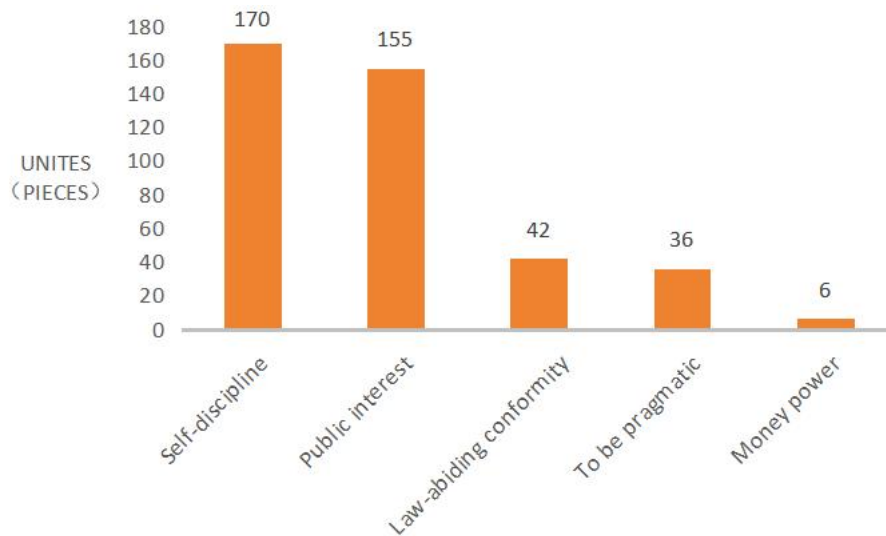


Figure 10 From 2016 to 2020, netizens distrust the values of the sampling results of bulk food

## 2.2 Trust factors influencing the qualified rate of bulk food supervision and sampling inspection

### 2.2.1 Ability and motivation of the government to supervise the sampling inspection

**work.**Based on the supervision and sampling inspection data of bulk food in 2016-2020, a total of 954 netizen comments related to ability trust and motivation trust were extracted for analysis. Of these, 724 comments were related to "ability trust" and 230 comments were related to "motivational trust" (see Figure 11). Based on the knowledge of Chinese emotional attitude dictionary analysis ability trust and

motivation trust related netizens emotional attitude found that the public of supervision and sampling department and sampling work "ability" trust ", " motivation "is given priority to with negative emotional attitude, at the same time" motivation trust "cause negative emotional attitude is higher than" ability to trust " (see figure 12).

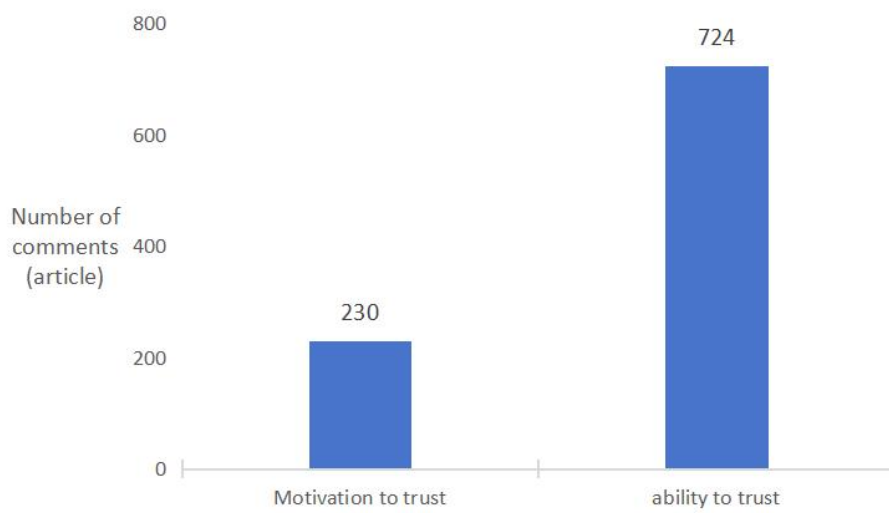


Figure 11 The number of netizen comments related to competency trust and motivational trust from 2016 to 2020

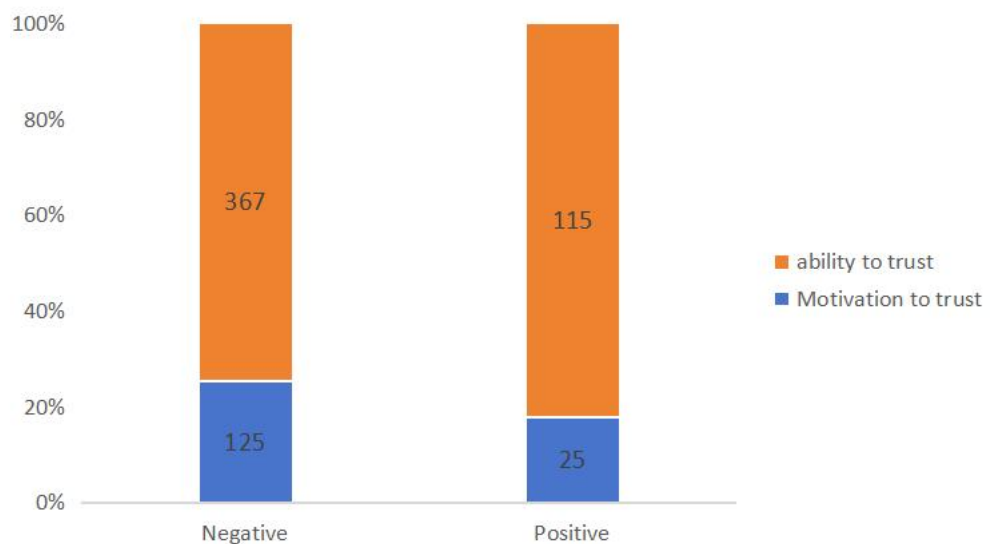


Figure 12 Ability trust and motivation trust related to the emotional and attitude tendency of netizens' comments

**2.2.2 Different tendencies of speech.**Based on two kinds of sampling results ("all

qualified" and "unqualified") and three kinds of speech ("emphasis on qualified" "unqualified" and "no tendency") classification, analysis of netizens comments found that when the sampling results all qualified, "no tendency" comments under netizens attitude trust, emotional trust are high, + 48%, 35% respectively. Under the tendency of "emphasis on qualification", netizens' attitude and emotional trust are low, with + 42% and-42% respectively. In addition, under the tendency of "no tendency" speech, netizens are low, with + 7%. When the sampling results are unqualified, under the tendency of "emphasizing unqualified", netizens have high attitude and emotional trust, with + 11% and-18% respectively. Under the tendency of "emphasis on qualification", netizens' attitude and emotional trust are low, with-12% and-57% respectively. Under the tendency of "no tendency" speech, the trust of netizens' attitude and the trust of value judgment is low, with-21% and-33% respectively (see Figure 13).

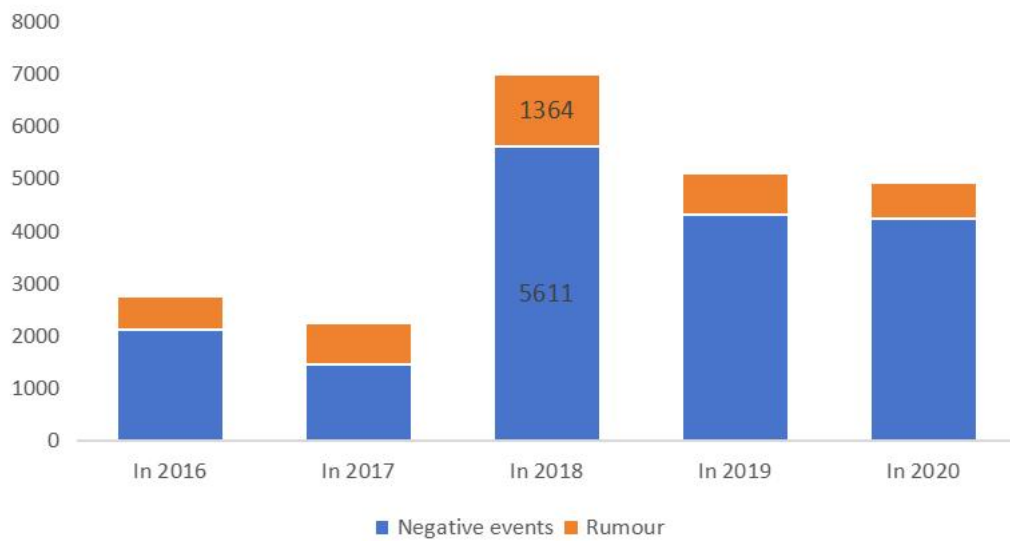
	Attitude	Emotio	Sense of worth	Attitude	Emotion	Sense of worth
Emphasize	—	—	—	High (+ 11%)	High (-18%)	Medium (-7%)
No tendency	High (+ 48%)	High (-35%)	Low (7%)	Low (-21%)	Medium (-39%)	Low(-33%)
Emphasize	Low (+ 42%)	Low (-42%)	High (22%)	Medium (-12%)	Low (-57%)	High (-6%)
	All the sampling results are all qualified			The sampling results are unqualified		

Figure 13 "Objective sampling results & speech tendency" 2X3 matrix netizen trust analysis

**2.2.3 Exposure of negative events and rumor dissemination.** The annual trend of negative events and rumors related to bulk food in the past five years indicates that the negative events and rumors in 2018, with a large number of negative food safety events reaching 5611, accounting for 31% of the total in the past five years, and the amount of information related to rumors was the highest, reaching 1364, accounting

for 30% of the total in the past five years (see Figure 14).

The proportion of insecurity caused by negative events to netizens was not obvious, but the proportion of security declined year by year, and the proportion of security was highest in 5696, accounting for 17% of the annual total (see Figure 15); the proportion of insecurity caused by rumor spread was compressed, the proportion of insecurity was highest in 2018, and the relevant information reached 5609, accounting for 47% of the annual total, but the proportion of safety emotion did not recover significantly, and the emotional expression of netizens turned to "uncertain" (see Figure 16).



*Figure 14 Annual trend of negative events and rumors related to bulk food information*

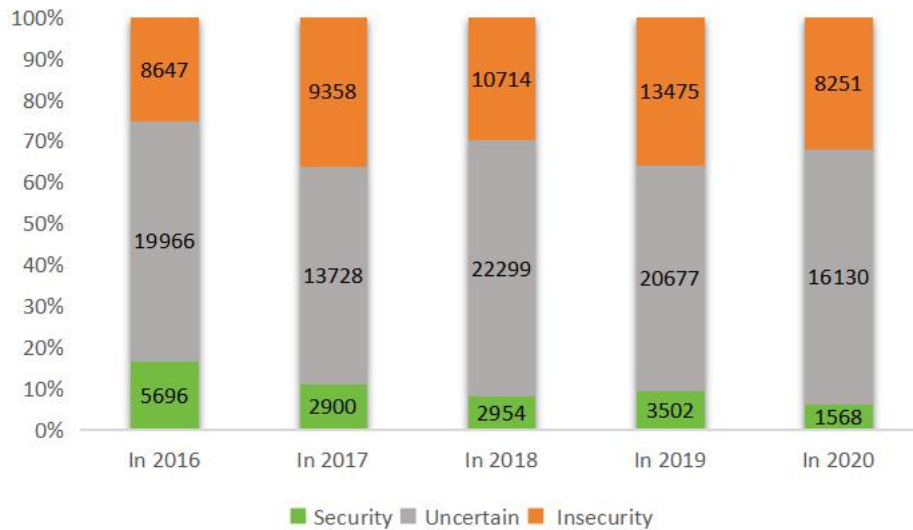


Figure 15 Negative events trigger an annual trend of insecurity among netizens

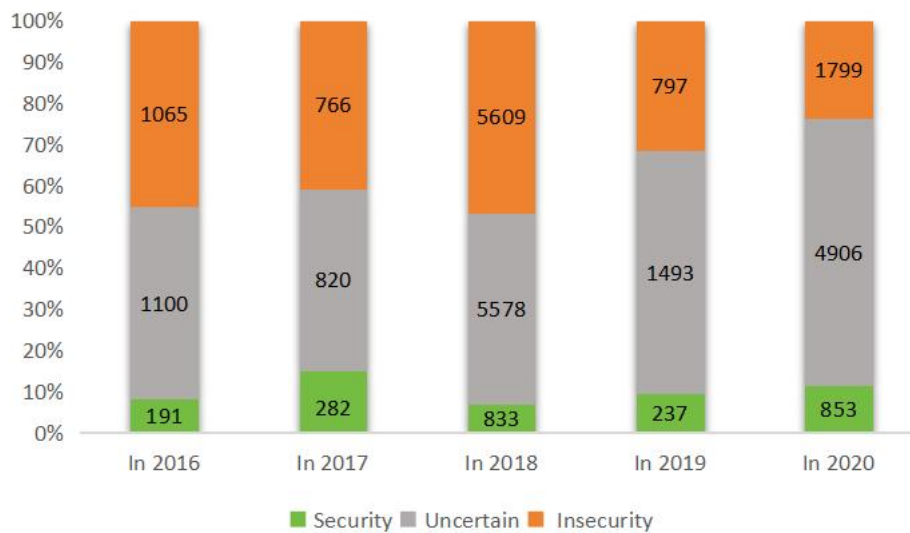


Figure 16 The spread of rumors has triggered an annual trend of Internet user insecurity

### 3 Discussion

#### 3.1 Analysis of emotion, attitude and values of sampling results of bulk food

**3.1.1 sentiment analysis.** From the emotional point of view, the public in the past five years to the emotional trust of the bulk food sampling results is generally low. The public's emotional expression of trust is mainly "happiness, sadness and fear". Among them, "happy" emotion is mainly expressed in the "qualified" food in the sampling results and the "unqualified" food, "sad" and "fear" emotions in the sampling results, and some netizens expand to worry about the overall food safety environment.

The expression of public distrust is mainly "doubt", which refers to four aspects.

First.

**3.1.2 Attitude analysis.** From the attitude point of view, in the past five years, the public's trust towards the results of bulk food sampling inspection has been gradually increasing. The public trust attitude is mainly "praise", the specific content points to two aspects: one is to affirm the sampling work is effective, hope to expose more unqualified products; the second is to pass all qualified sampling results of food. The expression of public distrust is mainly "derogatory", which points to three aspects: first, for the announcement of sampling inspection; second, for the sampling inspection methods and standards; and third, for the supervision.

**3.1.3 Values analysis.** From the perspective of values, in the past five years, the public trust in the results of bulk food sampling values is generally not high. The value of public trust mainly points to the two factors of "law-abiding conformity" and "public interest". "Law-abiding conformity", mainly supports the government departments to strictly investigate and punish bad merchants; "public interest", mainly praises the supervision and sampling inspection for the people and expects to expose more unqualified products. The value of public distrust mainly points to two factors: "character self-discipline" and "public interest". In terms of "character and self-discipline", the result of the qualified rate is cheating. In terms of "public interest", the public inspection announcement is not detailed and transparent.

*3.2 Analysis of the trust influencing factors of the qualified rate of the supervision and sampling inspection of bulk food*

### ***3.2.1 The ability and motivation of the government to supervise the sampling work***

***shall affect the public's trust in the sampling results.*** The ability trust of the government refers to the public's perception of the competence of the government departments, while the motivational trust refers to the public's perception of whether the public interest can be considered when the government departments take actions. The results show that the public's "motivation trust" and "ability trust" to the supervision and sampling work are both low, and the negative emotional attitude caused by "motivation trust" is relatively higher. From netizens specific comments, "ability trust" related negative emotional attitude mainly points to content are: one is questioned the current testing standard is effective, the second is that supervision, penalties, three is that sampling range is not enough, samples is not representative, "motivation trust" related negative emotional attitude mainly points to content are: one is suspected of corruption, the official conceal, not reported, three is that only release sampling results announcement also can not solve the practical problems of consumers, four is to reflect the sampling product is not their concern, not often contact or have not heard of.

### ***3.2.2 Different speech tendencies affect the public's trust in the sampling***

***results.*** Based on two kinds of sampling results and three kinds of speech classification, analysis of Internet comments found: when the sampling results announcement to "emphasize unqualified" speech, netizens generally expressed high trust attitude and trust emotion, mainly for regulators to publish unqualified product information, and in the recognition of the official sampling results for individual

edible unqualified products or favorite products were detected unqualified and sad mood. When sampling results announcement to "qualified" comments tend to release, netizens generally expressed distrust and distrust emotion, mainly for the hundred qualified rate or high rate of qualified data, the sample range or inspection standard sampling work link, and for a small amount of unqualified product information released.

**3.2.3 *The exposure of negative events and rumor rumors reduce the public's food security.*** Through the analysis of netizens' cognition and expectation on the results of food supervision and sampling inspection, it is found that negative food safety incidents and rumors continue to bring a certain degree of "insecurity" to the public. The changing trend in recent five years shows that the proportion of insecurity caused by negative events to netizens is not obvious, but the proportion of security is declining year by year; the proportion of insecurity caused by rumor spread is compressed, but the proportion of safety emotion has not recovered significantly, and the emotional expression of netizens is mostly "uncertain", which indicates that negative food safety events and rumor spread still have more adverse effects on the daily life and emotional cognition of netizens.

To sum up, the high qualified rate of supervision and sampling inspection of bulk food is difficult to be transformed into subjective security, so it is necessary to enhance public trust. First of all, to enhance the ability of trust and motivation of trust as the core, optimize the government supervision and sampling work. Strengthen the public communication between sampling inspection methods and standards, establish



rational subjective food safety cognition; secondly, pay attention to the presentation method and timeliness of sampling inspection announcement, and deliver accurate information. In terms of presentation content, pay attention to the comprehensiveness, clarity and readability of announcement information; use "speech tendency" carefully in presentation form; and timeliness in release time. Finally, strengthen the public opinion guidance of negative events and rumors of food safety, continue to carry out daily science popularization, and gradually correct the deviation of public cognition. In addition, we should take sudden and major events as an opportunity to help the public establish scientific and rational cognition.

## Reference documentation

- [1] Sun Yongli. (2021). China's food safety situation is generally stable and improving. *China Food industry* (07), 52-55.
- [2] Yin Shijiu, Chen Mo, Xu Yingjun & Li Zhongqiao. (2013). Consumer trust evaluation of safety certified food and its influencing factors —— Empirical analysis based on the ordered Logistic model. *Journal of Public Administration* (03), 110-118 + 142.
- [3] Zhang Hongxia. (2018). Analysis of the influencing factors of consumers' trust in online shopping for food safety. *Soft Science* (05), 116-119. doi:10.13956/j.ss.1001-8409.2018.05.26.
- [4] Li Cuixia & Jiang Bing. (2015). Trust evaluation of dairy products quality and safety from the perspective of scenario and quality —— Based on the survey data of consumer dairy products consumption in 12 provinces. *Agricultural and economic problems* (03), 75-82+111-112. doi:10.13246/j.cnki.iae. 2015.03.012.
- [5] Zhang Shuping. (2014). Research on the impact of the multi-brand crisis event on the trust of the dairy industry (doctoral dissertation, China Agricultural University). Dr. [https://kns.cnki.net/kcms2/article/abstract?v=K-Um1AVqjsIkWXuNWk8THfEIViRKrb2CjKCmn6mB5y5M8hPmmWszXnDTEpIMaWkDS4Y9YYkJHMS1GBxSuMlxaO5gGlbPy19j5bQfcUgVVOG6QdJ4E13dKOyLS2DvXQ1J6sqYLKYFQEW9sEPyE-DuyiE9OCPzP9n-aP1CIyTaZiSTcAOdqYxAJApQP0zx-Ak\\_&uniplatform=NZKPT&language=CHS](https://kns.cnki.net/kcms2/article/abstract?v=K-Um1AVqjsIkWXuNWk8THfEIViRKrb2CjKCmn6mB5y5M8hPmmWszXnDTEpIMaWkDS4Y9YYkJHMS1GBxSuMlxaO5gGlbPy19j5bQfcUgVVOG6QdJ4E13dKOyLS2DvXQ1J6sqYLKYFQEW9sEPyE-DuyiE9OCPzP9n-aP1CIyTaZiSTcAOdqYxAJApQP0zx-Ak_&uniplatform=NZKPT&language=CHS)
- [6] Shi Jingnan. (2014). Research on Food Safety Confidence of Chinese Consumers-

-Research from the field of dairy products (Master's dissertation, Jilin University).

Master.

[https://kns.cnki.net/kcms2/article/abstract?v=K-Um1AVqjsKSODhIgpTTHXaS5ZXogfROJY9j-pBROkKxjJLic9x8UbsHTMYWisqVyHHxbRVtuIhtXQfx4F6zqku1XTQ1\\_nafs\\_2EFekqRMagTVPWoSHaTRzgCn1vDXZdbQblDukB3VjcLZt0pB64JFrYudSfEXcKMifQgU1m-nOo3pLQJWOAy4dL\\_PswmEkjywP3diUEK8=&uniplatform=NZKPT&language=CHS](https://kns.cnki.net/kcms2/article/abstract?v=K-Um1AVqjsKSODhIgpTTHXaS5ZXogfROJY9j-pBROkKxjJLic9x8UbsHTMYWisqVyHHxbRVtuIhtXQfx4F6zqku1XTQ1_nafs_2EFekqRMagTVPWoSHaTRzgCn1vDXZdbQblDukB3VjcLZt0pB64JFrYudSfEXcKMifQgU1m-nOo3pLQJWOAy4dL_PswmEkjywP3diUEK8=&uniplatform=NZKPT&language=CHS)

[7] Song Kai. (2020). Research on the lack of trust in dairy consumers (master's dissertation, Shandong Agricultural University). Master of Arts

<https://link.cnki.net/doi/10.27277/d.cnki.gsdnu.2020.000851doi:10.27277/d.cnki.gsdnu.2020.000851>.

[8] Qi Yujue, Yang Dongtao & He Yumei. (2018). Institutional trust in the organization: concept, structural dimension and measurement. Economic management (02),192-208.doi:10.19616/j.cnki.bmj. 2018.02.012.

[9] Li Taiping & Bo Huimin. (2022). Quantitative evaluation of food safety supervision in China. Food industry technology (14),301-310.doi:10.13386/j.issn1002-0306.2021100174.

[10] Jiang Yihan. (2021). Analysis of the problems and countermeasures of the government supervision of food safety in China. Modern food (14),44-46.doi:10.16736/j.cnki.cn41-1434/ts. 2021.14. 013.

[11] Dong Yue & Wang Meng. (2019). Case study of online public opinion based on sentiment analysis and LDA model. Value Engineering

(34),169-172.doi:10.14018/j.cnki.cn13-1085/n. 2019.34. 076.

[12] Cao Chen. (2017). Innovative food supervision mode in the era of big data. The Food Safety Guide (15),11.doi:10.16043/j.cnki.cfs. 2017.15.006.

[13] Jiang Yanshu, Liu Lingjun, Li Daoxia, Wang Jian & Li Renwei. (2022). Study on timely air aggregation and analysis of sampling inspection results of Food Safety Supervision in Sichuan Province from 2017 to 2020. Journal of Capital Normal University (Natural Science Edition) (06),37-45.doi:10.19789/j.1004-9398.2022.06.006.

[14] Ma Ying, Tian Li, Qi Jingkun, Yu Xin, Tao Weiling, Zhanghe Station & Zou Jian. (2013). Experience on supervision and inspection of equipment management and equipment of food and drug inspection institutions. Chinese Journal of Medical Devices (05), 370-372.

[15] Lindley, J. . (2022). Food regulation and policing: innovative technology to close the regulatory gap in australia. Journal of Consumer Protection and Food Safety, 17(2), 127-136.