

Consumers' Attitudes Towards GM Food in China

by

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Abstract

Over 25 years of research and development on genetically modified food, consumers' attitudes have been changing. This paper builds on the previous field surveys on consumer attitudes and behaviors towards GM food in China. It analyzes not only people's attitudes towards food containing GMOs but also their attitudes towards the labeling regulation of GM food. 24.9% of respondents know GM food well, 64.6% just know a little, and 10.4% don't know something about GM food. 0.0% of respondents think that GM food is safe, 18.8% think that GM food may be safe, 50.4% think that it may not be safe, 20.4% think that it is not safe, and 10.4% don't know whether GM food is safe or not. 0.0% of respondents strongly support GM food entering the market, 6.9% support it, 41.0% are neutral, 46.6% against, and 5.6% strongly against. 0.3% of respondents know the labeling regulations of GM food well, 19.8% just know a little of them, 53.7% are not quite clear about the regulations of GM food, and 26.2% do not know anything about them. Finally, the limitation of this study is discussed.

Keywords: consumer attitudes, GM food, labeling, field survey, China

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Introduction

Genetical modification (GM) technology and genetically modified (GM) food are highly controversial topics for global consumers. Since the discovery of genes by Gregor Mendel in 1865, research on genes has not stagnated (Mendel 1866, p.3-47). In 1935, Andrei Nikolaevitch Belozersky discovered DNA, and isolated pure DNA (Белозерский 1936, p.136-146). In 1940, plant breeders learned to use radiation or chemicals to change an organism's DNA (Wieczorek 2012). In 1967, DNA ligases were discovered (Stewart 2009, p.17365-17369). In 1968, M. Meselson's group, H. O. Smith, K. W. Wilcox, and T. J. Kelley, discovered restriction enzymes that allowed DNA to be cut at specific places and separated out on an electrophoresis gel (Meselson 1968, p.1110-4). In 1972, Paul Berg used restriction enzymes and DNA ligases to create the first recombinant DNA molecules. He combined DNA from the monkey virus SV40 with that of the lambda virus (Jackson 1972, p2904-9). In 1973, the first artificial genetic modification accomplished by biotechnology was transgenesis, the process of transferring genes from one organism to another (Gutsch 1973, p100-4). Since then, the research on genes has reached a higher level, genetically modified animals, genetically modified bacteria, genetically modified plants, and genetically modified viruses were produced. With the first genetically modified food being produced in 1994 (Martineau, p191), the discussion surrounding genetically modified food has never stopped. In order to regulate genetical modification technology and genetically modified food, various countries have issued relevant laws and regulations.

In order to reduce the risks of genetically modified food in China, the Chinese government

has taken a series of measures. In 1993, China's State Science and Technology Commission promulgated "Genetic Engineering Safety Management Measures", which directs genetic engineering research and development across the country (Ministry of Science and Technology of China 1993). In 1997, China issued safety certificates for genetically modified shelf-stable tomatoes and insect-resistant cotton and approved the commercial cultivation of genetically modified insect-resistant cotton (Zhang 2007, p32-42) (Wang 2010, p48-49). In 1998, the herbicide-resistant medium indica isotype recovery line G Miyang 46 and its transgenic hybrid rice developed by the China Rice Research Institute passed expert identification (Wang 2010, p48-49). In 1999, China issued safety certificates for genetically modified petunias and disease-resistant peppers (Wang 2010, p48-49). In 2000, China's State Environmental Protection Administration and other eight departments jointly formulated the "China National Biosecurity Framework" (Wang 2010, p48-49). In 2006, China issued safety certificates for disease-resistant genetically modified papaya (Wang 2010, p48-49). In 2009, The Ministry of Agriculture of China issued the safety certificate for transgenic insect-resistant rice Huahuan No. 1, insect-resistant rice Bt Shanyou 63, and trans phytase maize (Wang 2010, p48-49). In 2010, Document No. 1 of the Central Committee of China clearly states that "we will continue to implement major special projects for the cultivation of new varieties of genetically modified organisms, step up the development of functional genes and new biological varieties with important application value and independent intellectual property rights, and promote the industrialization of new genetically modified varieties on the basis of scientific assessment and management according to law." (Ministry of Agriculture

and Rural Affairs of the People's Republic of China 2010). In 2020, China issued biosafety certificates for insect-resistant herbicide-tolerant genetically modified maize and herbicide-tolerant genetically modified soybeans (Ministry of Agriculture and Rural Affairs of the People's Republic of China 2020). In 2021, China approved 187 agricultural GMO safety certificates (production and application) and 34 agricultural GMO safety certificates (import) (Ministry of Agriculture and Rural Affairs of the People's Republic of China 2021).

Table 1 (Previous Surveys from 2006 to 2018)

Survey Time	First Author	Publish Time	Questionnaire (number of respondents)	Sampling Location	Attitude Classification			
					Support(%)	Oppose(%)	Neutral(%)	Support/oppose
2002	Huang Jikun	2006	1005	5 provinces	57.0	11.0	24.0	5.18
2006	Liu Zhiqiang	2007	305	Jinan City	20.2	13.5	66.2	1.50
2007	College of Life Sciences of Nanjing Agricultural University	2007	481	Nanjing City	33.0	16.0	51.0	2.06
2009	Zhou Meihua	2009	300	Changsha City	42.0	24.3	33.7	1.73
2010	Fan Liyan	2010	925	Shijiazhuang City	19.9	12.3	67.8	1.62
2010	Shen Juan	2011	493	Nanjing City	19.7	12.3	67.8	1.62
2010	Li Pingxiu	2010	200	Guangzhou City	34.4	13.6	52.0	2.52
2010	Greenpeace International Media Survey Laboratory, Tsinghua University	2010	610	Beijing, Shanghai & Guangzhou	35.0	18.0	48.0	1.94
2011	Mao Xinzhi	2011	816	Hubei Province	56.1	43.9	/	1.28
2011	Feng Liangxuan	2012	1170	6 cities	55.5	35.3	19.1	1.57
2011	Wu Weicheng	2011	1000	Chengdu City	34.0	24.3	41.7	1.40
2011	Xue Xipeng	2012	170	Hangzhou City	34.7	29.9	35.4	1.16
2012	Ruan Jinlin	2013	200	Shenzhen City	32.0	37.2	30.8	0.86
2012	Zheng Kaiyun	2013	291	Chengdu City	23.0	29.2	47.8	0.79
2013	Zhang Yijing	2015	952	15 provinces	26.2	27.1	37.9	0.97
2014	Li Qianru	2015	361	Anhui Province	10.2	50.1	39.6	0.20
2014	Zhang Xinmi	2014	200	Chengdu City	37.0	51.0	12.0	0.73

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2015	Guo Lang	2015	187	Zhuzhou City	24.6	66.8	8.6	0.37
2016	Meng Lingxian	2016	934	Shanxi Province	19.3	30.5	50.2	0.63
2016	Kai Cui	2018	2063	Nationwide China	11.9	41.4	46.7	0.29

As Table 1 shows, since 2002, surveys have been conducted in China on consumers' behavioral indicators about GM food, such as consumer appetite, GM labeling sensitivity, and price sensitivity. Because of COVID-19, the latest data has not been released yet. With the development of science and technology, consumers are increasingly pursuing a high-quality life. But at the same time, with the intensification of global warming, environmental pollution, frequent natural disasters, and epidemics, consumers are more inclined to worry about the quantity and quality of food. Under these circumstances, will people have any change in their attitudes towards genetically modified food? There has been a general lack of fundamental studies on the levels of consumers understanding of genetically modified food, and the labeling regulation of genetically modified food. It is important for consumers to know what they are buying. And it is also important to know how far the consumers trust the labeling. Moreover, respondents in the previous surveys have similar lifestyles in urban Han Chinese cities. However, China is a very diverse country on account of lifestyles, ethnicity, religion, etc. This study benchmarks the consumers' attitudes towards genetically modified food in China across the following six dimensions: geography, gender, age, level of education, income levels, and whether or not they have children to look after. These dimensions do not include ethnicity and lifestyle but they are relative to geography because this study assumes that, for example, a Mongolian person who has been settled in Beijing is likely to follow the Beijing

lifestyle rather than that in Inner Mongolia. For geographical analysis, this study divides the data by provinces in which individual respondents habitually reside, rather than by places where they happened to find this survey. This study especially chose Inner Mongolia, along with other northern areas such as Beijing and Shaanxi, as well as Suzhou in the southern China to get data from a diverse range of people who have different lifestyles across China. In total, 393 respondents answered my questionnaires. The findings of this survey provide Chinese consumers' attitudes toward genetically modified food and labeling regulations.

Literature Review

The Development of GM Technology in China

In 1993, China's State Science and Technology Commission promulgated "Genetic Engineering Safety Management Measures", which directs genetic engineering research and development across the country.

In 1997, China issued safety certificates for genetically modified shelf-stable tomatoes and insect-resistant cotton and approved the commercial cultivation of genetically modified insect-resistant cotton.

In 1998, the herbicide-resistant medium indica isotype recovery line G Miyang 46 and its transgenic hybrid rice developed by the China Rice Research Institute passed expert identification.

In 1999, China issued safety certificates for genetically modified petunias and disease-resistant peppers.

In 2000, China's State Environmental Protection Administration and other eight departments jointly formulated the "China National Biosecurity Framework".

In 2006, China issued safety certificates for disease-resistant genetically modified papaya.

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In 2010, Document No. 1 of the Central Committee of China clearly states that "we will

continue to implement major special projects for the cultivation of new varieties of genetically modified organisms, step up the development of functional genes and new biological varieties with important application value and independent intellectual property rights, and promote the industrialization of new genetically modified varieties on the basis of scientific assessment and management according to law.”

In 2020, China issued biosafety certificates for insect-resistant herbicide-tolerant genetically modified maize and herbicide-tolerant genetically modified soybeans.

In 2021, China approved 187 agricultural GMO safety certificates (production and application) and 34 agricultural GMO safety certificates (import).

The Regulations of Labeling in China

China has strict labeling requirements for GM food products. Any pre-packaged food containing GM ingredients must clearly indicate this information on the label. The labeling must be accurate and not misleading to consumers.

According to the Regulations for the Administration of the Labeling of Agricultural Genetically Modified Organisms, all agricultural genetically modified organisms listed in the labeling management catalog and used for sale shall be labeled. The identification is annotated as follows:

(1) Genetically modified animals and plants (including seeds, breeding animals and poultry, aquatic seeds) and microorganisms, genetically modified animals and plants, microbial products, seeds, breeding animals and poultry, aquatic seeds, pesticides, veterinary drugs, fertilizers and additives containing genetically modified animals and plants, microorganisms or their product components, and other products shall be directly marked as "genetically modified × ×".

(2) Direct processed products of genetically modified agricultural products are marked as "genetically modified × × processed products (finished products)" or "processed raw materials are genetically modified × ×".

(3) Products made by processing agricultural genetically modified organisms or products containing agricultural genetically modified organisms, but the final sales products no longer contain or cannot detect genetically modified ingredients, marked as "this product is made of

genetically modified ××, but this product no longer contains genetically modified ingredients" or marked as "there are genetically modified ×× in the raw materials processed of this product, but this product no longer contains genetically modified ingredients".

The Notice on Guiding the Management of GMO-related Advertisements issued by the former Ministry of Agriculture clearly states that the use of non-GMO advertising words is prohibited if the GMO crop and its processed products do not exist on the market; If the market does have the GM crop and non-GMO crop and its processed products, it can be labeled as non-GMO, but the use of misleading advertising words such as healthier and safer is prohibited.

The products in the labeling management catalog (including 17 kinds in 5 categories) can be labeled as non-GMO if they are non-GMO production. However, considering that labeling non-GMO labels may cause consumer cognitive discrimination against GMO products, it is not conducive to the development and application of GMO technology. In addition, the new GB 7718 consultation draft also adds that foods produced without genetically modified raw materials must not be labeled as "non-GMO foods". (Ministry of Commerce. PRC, 2019) In summary, it is recommended that enterprises do not carry out identification.

People's Attitude Towards GM Food

A survey that was conducted in Nanjing and published in 2022 collected a total of 526 valid respondents (including online survey respondents). (Minsi Xu, Xiao Cui, 2022) Among them, 15.6% are under 18 years old, 60.3% are 19-25 years old, 18.3% 26-40 years old, 4% 40-60 years old, and 1.9% over 60 years old. 75.7% had heard about GM foods, 24.3% had not heard of them, 61.6% had some understanding of their meaning, 13.7% know very well and 24.7% knew very little about them. Their sources of information about GM foods are mainly online news media, newspapers and magazines, and other media. The combined proportion of the two reached 67.1%, and only 14% knew about GM foods through professional books. 49% of people tend to choose non-GM foods, compared with 13% who prefer GM foods, and 38% of people do not care whether their food is GM or not. Only 22% of the respondents think that the total social benefits of GM foods outweigh any harm, 11% think that the harms outweigh the benefits, 33% think that the disadvantages and benefits balance out, and the remaining 34% said not sure. When asked whether or not they supported the development of the genetically modified food industry, 33% of the respondents actively supported it, 16% firmly opposed it, and 51% were neutral. 83% of the respondents said they would like to know about GM foods and understand their ingredients. One third of the respondents expressed support for the development of GM foods, and the respondents who clearly expressed resistance or opposition were in the minority in both face-to-face and online questionnaires, and most of them had conservative and neutral attitudes towards GM foods. The public attitude towards

the genetical modification of food is rather balanced, not “one-sided”, and there is no talk of “skin discoloration due to the consumption of genetically modified food”. Among factors affecting their choice between genetically modified foods and conventional foods, safety comes first in order, followed by nutrition, price, and taste. In terms of the impacts of genetically modified foods, the respondents are more worried about genetic pollution and ecological environment deterioration than about global food shortage and food diversification. Many respondents believe that the country’s regulations are moderate and need to be made more stringent. They hope that scientific research units and enterprises will conduct their research and development safely, and the state will improve supervision, inspection methods, and conduct comprehensive examination of safety. (Minsi Xu, Xiao Cui, 2022) The limitation of their survey is that their survey was limited to Nanjing, which imposes regional constraints on the research findings. Additionally, the primary focus was on young people, including minors, introducing age-related limitations. The inclusion of minors in consumer-related inquiries raises questions about the reliability of their responses. These factors should be considered when interpreting the survey results.

A perception gap about GMO was reported in “Survey of Public Attitudes to GM Technology” which was published by *People.cn. Science and Technology Daily* in 2016 reports that the result of “Survey on Public Attitudes towards GM Technology” didn’t change a lot from those of the previous surveys, that the public awareness of GM has changed little, and the vast majority of the public consider think that they know little or nothing about GM. 59% of respondents said they had “never heard of it”. 66.5% of respondents had rural

registration and 41.1% urban registration. Of the respondents who had heard of GMOs, only 9.1% thought they knew “very much” or “a lot” about GMOs. 65.2% of the respondents opposed the promotion of the cultivation of genetically modified rice in China. 72.8% were unwilling to eat genetically modified food, and the public acceptance of genetically modified rice showed a significant downward trend. Yin Liu (2016) shows a rapid decline in public acceptance of GM foods: 31.3% of respondents believe a statement that “people who eat GM food will also be ‘genetically modified’”. Of these people, only 14.3% support the cultivation of GM rice, and 15.7% are willing to eat GM food. Among those who do not believe that statement, 33.3% support the cultivation of GM rice and 23.4% are willing to eat GM food (Yin Liu, 2016).

The sharp fall in the ratio of those who support GM food against those who oppose from 2002 to 2006 is attributable to the “collapse of soybean prices” in 2004 and the second big decline from 2013 to 2014 is attributable to the “golden rice” scandal in 2012.

In 2003, China joined the WTO, and Chinese soybean enterprises began to test international markets, organized groups to buy soybeans in the United States, and publicized it with great fanfare before traveling, and China Central Television (CCTV) news broadcasts reported about them. The news about China’s “collective purchase” led US soybean prices to skyrocket. Those Chinese soybean companies that like to “catch up” placed a large order of 8 million tons at higher prices. As soon as it was reported that these soybeans might have been genetically modified, the resale price immediately plunged, falling by nearly 50%. The Chinese companies hurriedly defaulted and became insolvent, eventually leading to the almost

total collapse of China's soybean industry in 2004 and they had to be purchased at low prices by several major multinational grain producers. This is the sensational "Soybean Price Fall" event. (Shiqu, 2022)

In 2000, scientists used transgenic technology to introduce the gene β -carotene, a precursor to vitamin A, into rice. Because of its golden yellow color with carotene, it is called "golden rice". In 2012, Greenpeace, a well-known environmental non-governmental organization, first exposed the Golden Rice scandal in Hengyang, Hunan Province. "Golden Rice" project itself was intended to be a beneficial research project, but the experimental process was not standardized, and those children and parents who took part in the project were not properly informed in advance that they were eating genetically modified golden rice, and each of the 25 children who participated in the experiment had to be compensated with 80,000 yuan. The media continued to pay attention to the episode, and the ignorant public remained greatly afraid. (Chen, 2014)

Research Question

Almost all past surveys conducted quantitative analysis only of consumers' attitude towards GM food. In terms of statistical base, the larger the better. However, it is difficult for the present author to compete with many of the past surveys in terms of quantity, namely, the number of respondents. However, China is very divergent, for example there is a huge difference between urban areas and rural areas, between north and south, between coastal areas and inner areas, etc. People's attitude also differ depending on their gender, age, education levels, income levels, and whether or not have children to look after. Therefore, the first of this paper's research question is what difference China's such diversity will make in the results of a similar survey. Consumers' attitude may differ depending on the credibility of GM food labeling. Therefore, the second research question is what is consumers' attitude towards GM food labeling.

Methodology

This paper conducts a survey by random sampling method. This paper prepares and distribute paper-based, written and structured questionnaires among populations of some target survey areas. In order to take samples as representative as possible from among China's divergent population, within the limit of the present author's time and manpower, survey areas selected as follows, consumers' attitude toward GM food and the GM food in Beijing, Inner Mongolia, Shaanxi, and Jiangsu, which collected a total of 393 valid responds. The reason why the present author chose Beijing is that Beijing is the capital of China, Shaanxi is

that it is the location of thirteen ancient capitals of China, Inner Mongolia is that people there have really different lifestyle than other plain areas, and Suzhou is that it is a very typical and historical southern city. There were so many travelers when the present author did the survey, in order to enhance the rigor, this paper have retained their habitual residence and categorized them based on the geographical regions of the south, north, and Inner Mongolia and Xinjiang.

This questionnaire consists of 20 questions. The first 6 questions are addressing the following six dimensions of the respondents: their habitual residence, gender, age, education levels, income levels, and whether or not they have children to look after.

The remaining 14 questions can be divided into two groups, those asking about their attitudes towards GM food and those about their attitudes towards the labeling regulations of GM food. For the sake of simplicity, this paper follows Allport (1935) in dividing "attitude" into three components: cognitive component, affective component, and behavioral component, although more recent social psychologists would separate behavior from attitude. Knowledge is a part of the cognitive component.

Table 2 (Attributes of the questions)

	GM FOOD	LABELING REGULATIONS
COGNITIVE COMPONENT	7. knowledge levels 8. source of knowledge 9. effort to keep abreast of development	14. awareness 15. regulations 16. awareness 17. labeling question 18. labeling question
AFFECTIVE COMPONENT	10. safety	19. trust 20. cost & benefit analysis
BEHAVIORAL COMPONENT	11. support GM entering consumer market 12. consumption of GM food 13. where to buy food	14. buy labeled food 16. checking labels

According to the table of questions concerning “attitude” towards GM food, question No. 7, 8, and 9 are about the cognitive component, 10 is about the affective component, and 11, 12, 13 are about the behavioral component. As regards the questions concerning attitude towards GM food labelling regulations, No. 15, 17, 18 are related to the cognitive component, 19 and 20 are related to a kind of “affective component”, although strictly speaking, these are being quite rational rather than being affective, and 14 and 16, are framed as questions about the behavioral component, but they are pertaining to cognitive processes, too.

Each of the fourteen questions about the respondents’ attitudes towards GM food and towards labelling are divided into six dimensions of the respondents. The following table shows the structure of the analysis:

Table 3 (Structure of the analysis)

A \ B	GM Food			GM Food Labeling		
	Cognitive	Affective	Behavioral	Cognitive	Affective	Behavioral
Geography						
Gender						
Age						
Education						
Income						
Children						

*A: Dimensions of respondents B: Components of attitudes

Questionnaire:

1. Address: _____
2. Gender
 - a. Male b. Female
3. Age
 - a. 20-30 b. 30-40 c. 40-50 d. 50-60 e. Over 60
4. Education
 - a. Up to primary school b. Middle school c. Technical secondary school d. High school e. Junior college f. Undergraduate school g. Graduate school or over
5. Income
 - a. 0-1,000 Yuan b. 1,000-5,000 Yuan c. 5,000-10,000 Yuan d. Over 10,000
6. Do you have children to look after?
 - a. Yes b. No
7. Do you know GM food?
 - a. Yes, very well b. Yes, but a little c. No

8. If you have heard of GM Food, how have you learned about it?
 - a. Social media
 - b. Science magazines
 - c. Books or documents
 - d. Expert lectures
 - e. TV programs
 - f. Family or friends
 - g. Teachers
 - h. Others_____
9. When you hear or see a news about GM food, do you check it?
 - a. Yes, everytime
 - b. Occasionally
 - c. Seldom
 - d. Never
10. Do you think GM food safe?
 - a. Yes, safe
 - b. May be safe
 - c. May not safe
 - d. Unsafe
 - e. I don't know
11. Do you support GM foods entering into the consumer market?
 - a. Yes, strongly support
 - b. Support but not strong
 - c. Neutrality
 - d. Against
 - e. Strongly against
12. How much percentage of GM foods do you think you consume in your daily diet?
 - a. Over 75%
 - b. Over 50%
 - c. Over 25%
 - d. 25% or less
13. Where do you usually go to buy food?
 - a. Supermarket or its online shop
 - b. online stores without physical stores
 - c. Food market
 - d. Others
14. Have you ever bought food that is clearly labeled or packaged as GMO?
 - a. Yes
 - b. No
 - c. Didn't pay attention
15. Do you know the Regulations for the management of the labeling of agricultural genetically modified organisms?
 - a. Yes, very well
 - b. Know a little
 - c. Not quite clear
 - d. No
16. Do you look at the food label or package when shopping to see if it contains GMO

ingredients?

- a. Yes, always b. Occasionally c. Seldom d. Never

17. Do you know what "non-GMO" means on the label in the picture?



- a. All the materials are GM-Free.
 b. Some of the materials have GMO and non-GMO, this product didn't use GMO.
 c. The main materials are non-GMO.
 d. I don't know.

18. Do you know why the picture is not signed "non-GMO"?



- a. All the materials are GMO
 b. All the materials are non-GMO.
 c. The main materials are GMO.
 d. The main materials are non-GMO.

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- e. The materials of this product do not have genetically modified organisms.
- f. I don't know.

19. How far do you trust the content of the Non-GMO label?

- a. Over 75%
- b. Over 50%
- c. Over 25%
- d. 25% or less

20. Which do you think is greater, the costs or the benefits of GM foods?

- a. $\text{Costs} > \text{Benefits}$
- b. $\text{Costs} = \text{Benefits}$
- c. $\text{Costs} < \text{Benefits}$
- d. I don't know

Data Analysis

For the following reasons, this paper presents two different versions of analysis, the simpler one and the subtler one, of each of the six dimensions concerning the respondents' characteristics. First, the simpler analysis is more helpful for those who want to grasp the general outlook. Second, the subtler data helps qualify and add to the simpler analysis. The simpler analysis divides the respondents into three broader groups, for example, in terms of the respondents' education levels, they are divided into primary, secondary, and tertiary education levels. The subtler analysis corresponds with the actual questions in the questionnaire, for example, the respondents' levels are actually divided into seven levels corresponding with the Chinese school system.

The first six questions of the survey correspond with six dimensions about the respondents' characteristics, followed by 14 questions that addressed their awareness, knowledge, and opinion on genetically modified food. The six dimensions are habitual residence, gender, age, education level, income level, and children to look after.

Six Dimensions

Habitual Residence

Table 1

Address	Number of Respondents	Percentage
Beijing	65	16.5
Inner Mongolia	58	14.8
Shaanxi	56	14.2
Jiangsu	42	10.7
Shanghai	23	5.9
Tianjin	21	5.3
Hebei	21	5.3
Zhejiang	20	5.1
Guangdong	17	4.3
Liaoning	16	4.1
Fujian	16	4.1
Henan	13	3.3
Heilongjiang	7	1.8
Xinjiang	6	1.5
Yunnan	5	1.2
Sichuan	4	1.0
Chongqing	3	0.8
Total	393	99.9

Table 1 shows the subtler breakdown of the respondents by the place of their habitual residence which amounted to 16 “provinces”. In other words, the respondents happened to answer that they normally reside in 16 different “provinces” across China, although the survey was conducted in Beijing, Shaanxi, Inner Mongolia, and Jiangsu.

Table 2

Area	Number of Respondents	Percentage
Northern Parts	199	50.6
Southern Parts	130	33.1
Inner Mongolia & Xinjiang	64	16.3
Total	393	100.0

Table 2 respondents the simpler breakdown of the respondents into the three regions: northern parts, southern parts, and “Inner Mongolia and Xinjiang”. Beijing, Shaanxi, Tianjin, Hebei, Heilongjiang, Liaoning, and Henan belong to the northern parts, Jiangsu, Shanghai, Zhejiang, Guangdong, Fujian, Yunnan, Sichuan and Chengdu belong to the southern parts.

Gender

Table 3

Gender	Number of Respondents	Percentage
Male	179	45.5
Female	214	54.5
Total	393	100.0

In terms of gender, it may have been more ethical for the survey to provide the third option, such as “I don’t want to answer”. This survey followed the practice in Chinese family registration.

Age

Table 4

Age	Number of Respondents	Percentage
20-29	85	21.6
30-39	92	23.4
40-49	95	24.2
50-59	86	21.9
60 & Over	35	8.9
Total	393	100.0

Table 4 gives the subtler breakdown of the respondents into five age groups, those in their twenties, thirties, forties, fifties, and “sixties and over”

Table 5

Age Range	Number of Respondents	Percentage
Youth (Younger Than 30)	85	21.6
Middle-age (30-50)	187	47.6
Elderly (Over 50)	121	30.8
Total	393	100.0

Table 5 gives the simpler breakdown into three age groups: youth (the twenties), middle age (30s-40s), and the elderly (50s and over).

Education

Table 6

Education	Number of Respondents	Percentage
Up to primary school	33	8.4
Middle school	3	0.8
Technical secondary school	1	0.3
High school	47	12.0
Junior college	91	23.2
Undergraduate school	128	32.5
Graduate school	90	22.8
Total	393	100.0

Table 6 shows the subtler breakdown of the respondents into seven levels of education, those who have got up to primary school education, middle school, technical secondary school, high school, junior school, undergraduate school, and graduate school.

Table 7

Education Level	Number of Respondents	Percentage
Primary Education	33	8.4
Secondary Education	51	13.0
Tertiary Education	309	78.6
Total	393	100.0

Table 7 gives the simpler breakdown into three levels of education: primary education, secondary education and tertiary education.

Income

Table 8

Income	Number of Respondents	Percentage
0-1000	0	0.0
1000-5000	109	27.7
5000-10000	183	46.6
Over 10000	101	25.7
Total	393	100.0

Table 8 gives the subtler breakdown of the respondents into four levels of income, those who earn 0-1,000 Yuan, 1,000-5,000 Yuan, 5,000-10,000 Yuan, and over 10,000 Yuan. Because there is no respondent who is located on the 0-1,000 Yuan level, the tables below start from the level of 1,000-5,000 Yuan.

Children

Table 9

Children to Look After	Number of Respondents	Percentage
Yes	166	42.2
No	227	57.8
Total	393	100.0

Table 9 shows two groups of the respondents, those who have children to look after and those who have not.

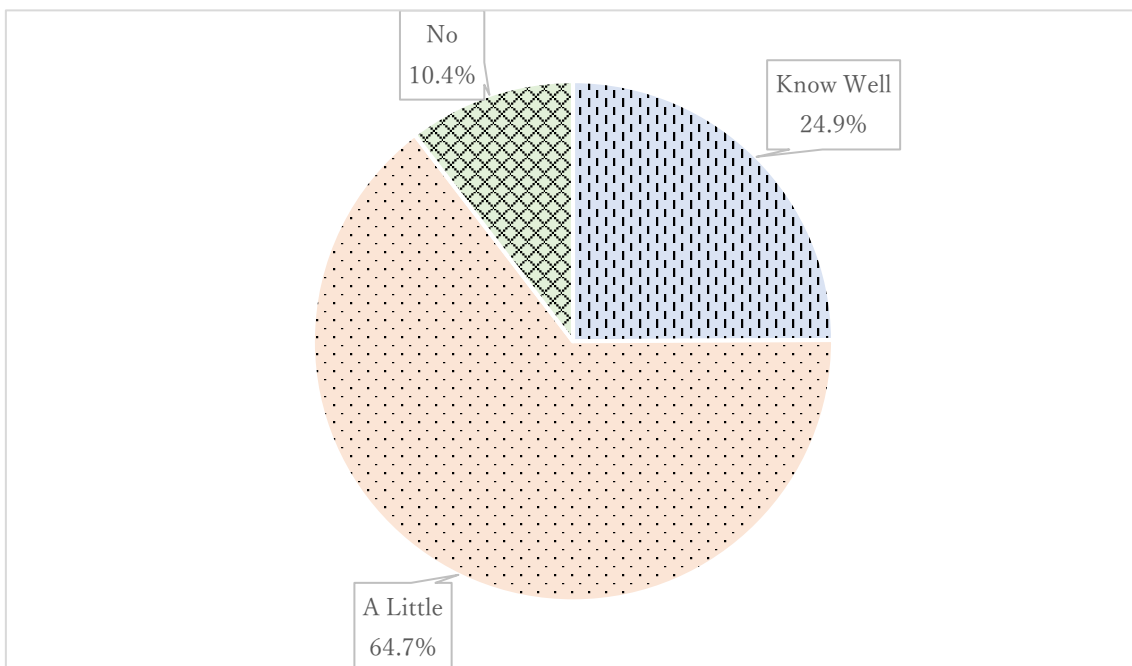
Questions & Analysis

Q7: Do you know GM Food well?

Table 11

Know GM Food	Number of Respondents	Percentage
Know Well	98	24.9
A Little	254	64.6
No	41	10.4
Total	393	99.9

Chart 1



Consumers' Attitudes Towards GM Food in China

Table 12

Know GM Food	Know Well	A Little	No	Total
Number of Respondents	98	254	41	393
Percentage	24.9	64.6	10.4	99.9
Northern Parts	52	137	10	199
Percentage	26.1%	68.8%	5.0	99.9%
Southern Parts	44	82	4	130
Percentage	33.8%	63.1%	3.1%	100.0%
Inner Mongolia & Xinjiang	2	35	27	64
Percentage	3.1%	54.7%	42.2%	100.0%
Male	54	113	12	179
Percentage	30.2%	63.1%	6.7%	100.0%
Female	44	141	29	214
Percentage	20.6%	65.9%	13.5%	100.0%
Youth	75	10	0	85
Percentage	88.2%	11.8%	0.0%	100.0%
Middle-age	19	158	10	187
Percentage	10.2%	84.5%	5.3%	100.0%
Elderly	4	86	31	121
Percentage	3.3%	71.1%	25.6%	100.0%
Primary Education	0	3	30	33
Percentage	0.0%	9.1%	90.9%	100.0%
Secondary Education	10	32	9	51
Percentage	19.6%	62.7%	17.6%	99.9%
Tertiary Education	88	219	2	309
Percentage	28.5%	70.9%	0.6%	100.0%
1,000-5,000	6	66	37	109
Percentage	5.5%	60.6%	33.9%	100.0%
5,000-10,000	49	131	3	183
Percentage	26.8%	71.6%	1.6%	100.0%
Over 10,000	43	57	1	101
Percentage	42.6%	56.4%	1.0%	100.0%
Have Children	42	109	15	166
Percentage	25.3%	65.7%	9.0%	100.0%
Don't Have Children	56	145	26	227
Percentage	24.7%	63.8%	11.5%	100.0%

As regards the place of habitual residence, among those who are living in the northern parts of China, 26.1% said they know GM food well, 68.8% said they know a little, and 5.0% said they know nothing. Among those who are in the southern parts, 33.8% said they know well, 63.1% a little, and 3.1% nothing. Among those who are in Inner Mongolia and Xinjiang, 3.1% well, 54.7% a little, and 42.2% nothing. From these, an inference can be drawn that GM food is not well-known in Inner Mongolia and Xinjiang, and people from the southern parts feel that they know more about GM food than the northern part people but only to a limited extent.

As regards gender, among those who said they are males, 30.2% know well, 63.1% a little, and 6.7% nothing. Among those who said they are females, 20.6% well, 65.9% a little, 13.5% nothing. From these, an inference can be drawn that males are more confident than females about their knowledge of GM food.

As regards age, among those who are young, 88.2% well, 11.8% a little, 0.0% nothing. Among those who are middle-aged, 10.2% well, 84.5% a little, 5.3% nothing. Among those who are elderly, 3.3% well, 71.1% a little, 25.6% nothing. Based on these, it might appear that GM food is well known only among the younger generation in China, but it is important to note that more than 84% of middle-aged people said that they knew “a little”. Experience shows that people tend to get more modest about their knowledge as they get older. So, it is risky to draw any definitive inference from the above findings.

As regards the level of education, among those who have attained primary education or less who comprise 8.4% of all the respondents, 0.0% said they know GM food well, 9.1% said they know a little, and 90.9% said they know nothing. Among those who have attained up to the

secondary level education who make up 13.0% of all the respondents, 19.6% know well, 62.7% a little, and 17.6% nothing. Among those who have attained the tertiary level or more, namely 78.6% of all the respondents, 28.5% know well, 70.9% a little, and 0.6% nothing. From these, an inference can be drawn that people who got higher education are more confident in their knowledge of GM food.

As regards the level of income, no respondents earned less than 1,000 Yuan a month. Among those who earned from 1,000 to 5,000 Yuan, 5.5% said they know well, 60.6% a little, and 33.9% nothing. Among those who earned from 5,000 to 10,000 Yuan, 26.8% well, 71.6% a little, and 1.6% nothing. Among those who earned over 10,000 Yuan, 42.6% well, 56.4% a little, and 1.0% nothing. From these, an inference can be drawn that GM food is more popular with people at high-income and middle-income levels than people who are at low-income level.

As regards the question whether or not they have children to look after, among those who have children to look after, 25.3% said they know well, 65.7% a little, and 9.0% nothing. Among those who do not have children to look after, 24.7% know well, 63.8% a little, and 11.5% nothing. From these, GM food is more popular with people who have children to look after.

For the cognitive component of the attitude toward GM food, according to question 7, most people know about GM food in China. When the respondents are differentiated by their places of habitual residence, the southern parts have the largest number of people who know about GM food, but only slightly more than the north. Nearly half of people in Inner Mongolia and Xinjiang don't know about GM food. When they are differentiated by age, almost all

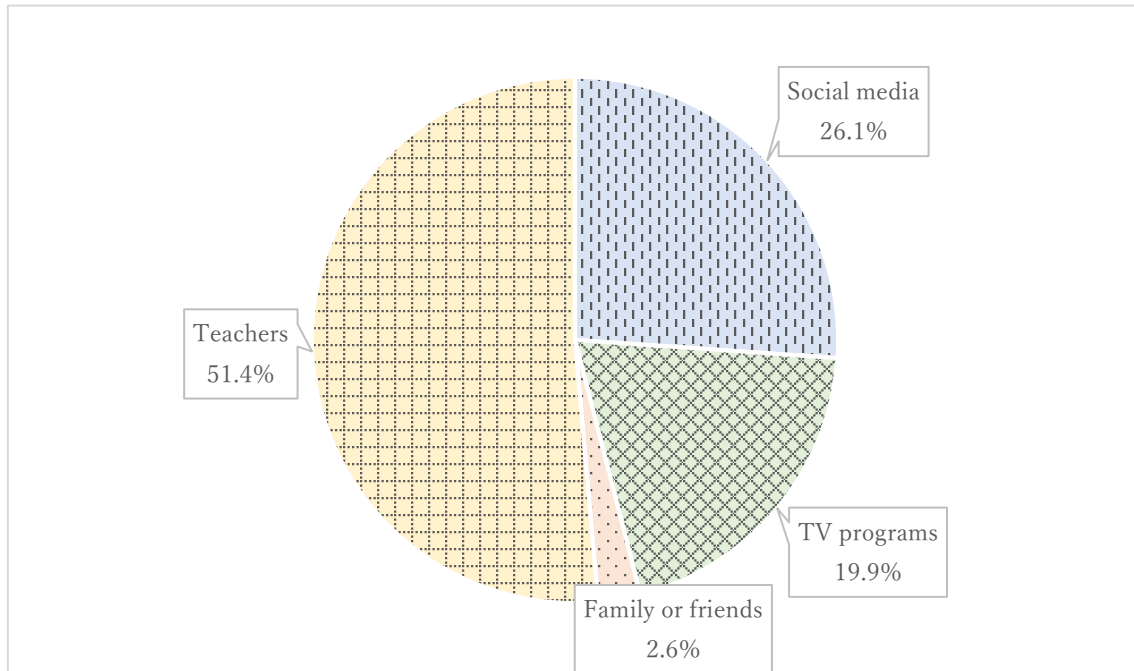
young people know about GM food, and elder people have the largest number of not know about GM food. When although framed as behaviors, that pertain to cognitive processes the respondents are differentiated by their levels of education, as education levels rise, the number of people who know about GM food becomes larger and larger. By income levels, it is mostly proportional to the level of income, the more people earn, the more people know about GM food. As regards whether have children to look after, people who have children to look after know more about GM food.

Q8: If you have heard of GM Food, how have you learned about it?

Table 13

Way to Know GM Food	Number of Respondents	Percentage
Social media	92	26.1
Science magazines	0	0.0
Books or documents	0	0.0
Expert lectures	0	0.0
TV programs	70	19.9
Family or friends	9	2.6
Teachers	181	51.4
Other	0	0.0
Total	352	100.0

Chart 2



Among all respondents, 26.1% of respondents know GM food by social media, 19.9% by TV programs, 2.6% by family or friends, and 51.4% by teachers.

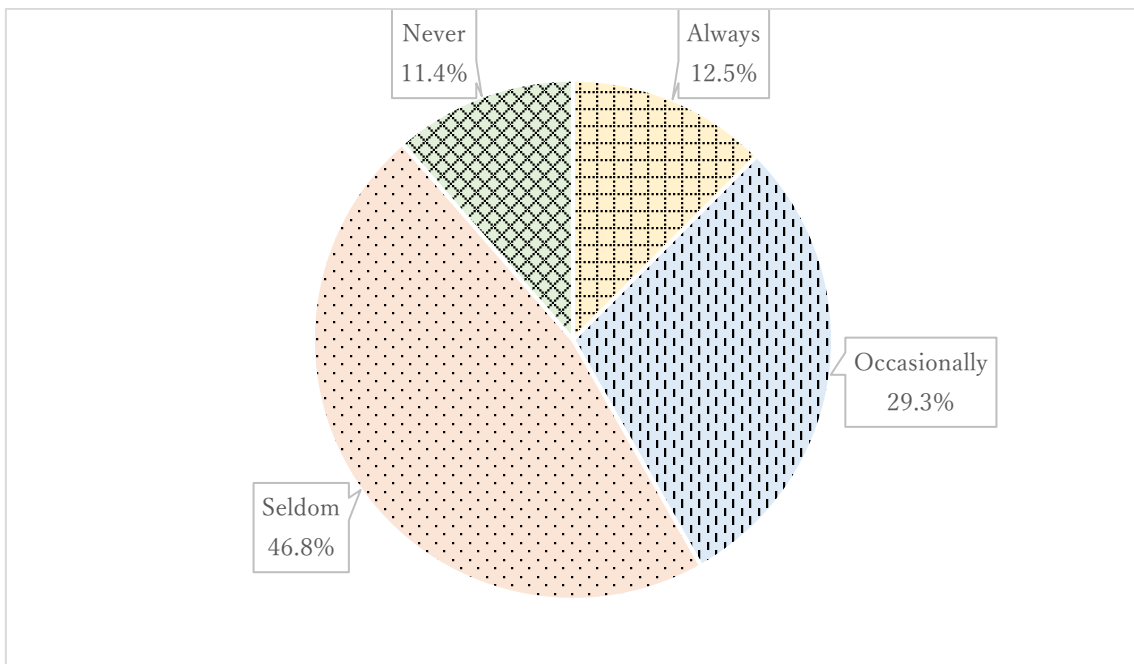
For the cognitive component of the attitude toward GM food, according to question 8, a lot of people learn about GM food from school. Some people learn about GM food from social media like TikTok. Some people learn about GM food from educational television programs. And a few people learn GM food from their family members or friends. According to that, people who learn GM food from school can have more correct and concrete knowledge of GM food than others.

Q9: When you hear or see news about GM food, do you check it?

Table 14

Check The News	Number of Respondents	Percentage
Always	49	12.5
Occasionally	115	29.3
Seldom	184	46.8
Never	45	11.4
Total	393	100.0

Chart 3



Consumers' Attitudes Towards GM Food in China

Table 15

Check The News	Always	Occasionally	Seldom	Never	Total
Number of Respondents	49	115	184	45	393
Percentage	12.5	29.3	46.8	11.4	100.0
Northern Parts	27	59	102	11	199
Percentage	13.6%	29.6%	51.3%	5.5%	100.0%
Southern Parts	22	51	53	4	130
Percentage	16.9%	39.2%	40.8%	3.1%	100.0%
Inner Mongolia & Xinjiang	0	5	29	30	64
Percentage	0.0%	7.8%	45.3%	46.9%	100.0%
Male	23	55	87	14	179
Percentage	12.8%	30.7%	48.6%	7.8%	99.9%
Female	26	60	97	31	214
Percentage	12.1	28.0	45.3	14.5	99.9
Youth	6	28	44	7	85
Percentage	7.1	32.9	51.8	8.2	100.0
Middle-age	34	74	74	5	187
Percentage	18.2	39.6	39.5	2.7	100.0
Elderly	9	13	66	33	121
Percentage	7.4	10.7	54.5	27.3	99.9
Primary Education	0	0	3	30	33
Percentage	0.0	0.0	9.1	90.9	100.0
Secondary Education	31	7	5	8	51
Percentage	60.8	13.7	9.8	15.7	100.0
Tertiary Education	18	108	176	7	309
Percentage	5.8	35.0	56.9	2.3	100.0
1,000-5,000 Yuan	4	23	52	30	109
Percentage	3.7	21.1	47.7	27.5	100.0
5,000-10,000 Yuan	20	61	98	4	183
Percentage	10.9	33.3	53.6	2.2	100.0
Over 10,000 Yuan	25	31	34	11	101
Percentage	24.8	30.7	33.7	10.8	100.0
Have Children	27	51	81	7	166
Percentage	16.3	30.7	48.8	4.2	100.0
Don't Have Children	22	64	103	38	227
Percentage	9.7	28.2	45.4	16.7	100.0

Consumers' Attitudes Towards GM Food in China

As regards the place of habitual residence, among those who are living in the northern parts of China, 13.6% said they always check the news of GM food, 29.6% said they occasionally check the news of GM food, 51.3% said they seldom check the news of GM food, and 5.5% said they never check the news of GM food. Among those who are in the southern parts, 16.9% always, 39.2% occasionally, 40.8% seldom, and 3.1% never. Among those who are in Inner Mongolia and Xinjiang, 0.0% always, 7.8% occasionally, 45.3% seldom, and 46.9% never.

As regards gender, among those who said they are males, 12.8% always, 30.7% occasionally, 48.6% seldom, and 7.8% never. Among those who said they are females, 12.1% always, 28.0% occasionally, 45.3% seldom, and 14.5% never.

As regards age, among those who are young, 7.1% always, 32.9% occasionally, 51.8% seldom, and 8.2% never. Among those who are middle-aged, 18.2% always, 39.5% occasionally, 39.6% seldom, and 2.7% never. Among those who are elderly, 7.4% always, 10.7% occasionally, 54.5% seldom, and 27.3% never.

As regards the level of education, among those who have attained primary education or less, 0.0% always, 0.0% occasionally, 9.1% seldom, and 90.9% never. Among those who have attained up to the secondary level, 60.8% always, 13.7% occasionally, 9.8% seldom, and 15.7% never. Among those who have attained the tertiary level or more, 5.8% always, 35.0% occasionally, 56.9% seldom, and 2.3% never.

As regards the level of income, no respondents earned less than 1,000 Yuan a month. Among those who earned from 1,000 to 5,000 Yuan, 3.7% always, 21.1% occasionally, 47.7% seldom, and 27.5% never. Among those who earned from 5,000 to 10,000 Yuan, 10.9% always,

33.3% occasionally, 53.6% seldom, and 27.5% never. Among those who earned over 10,000 Yuan, 24.8% always, 30.7% occasionally, 33.7% seldom, and 10.8% never.

As regards whether have children to look after, among those who have children to look after, 16.3% always, 30.7% occasionally, 48.8% seldom, and 4.2% never. Among those who do not have children to look after, 9.7% always, 28.2% occasionally, 45.4% seldom, and 16.7% never.

For the cognitive component of the attitude toward GM food, according to question 9, consumers seldom check whether the news is correct or not in China. When the respondents are differentiated by their places of habitual residence, consumers from the southern regions tend to have a greater awareness and inclination to verify the accuracy of news related to GM food. People from Inner Mongolia and Xinjiang exhibit a relatively weaker inclination to fact-check the news of GM food. When they are differentiated by gender, females tend to check the news of GM food more than males. When they are differentiated by age, consumers who are in their middle age are more concerned about the accuracy of news related to GM food. Elderly consumers are less likely to fact-check news of GM food. When they are differentiated by education level, consumers who get primary education or less, nearly don't check the news of GM food. It is perhaps caused by their knowledge, they don't know GM food, or they don't know how to check the news whether is right. In general, people would assume that those with higher education are more inclined to verify the accuracy of news about GM food. However, the results of this survey are quite surprising. Consumers who get tertiary education have more knowledge not only in GM food, but also other knowledge, but much fewer consumers are willing to check the news of GM food than the consumers who get secondary education.

Consumers' Attitudes Towards GM Food in China

When they are differentiated by income level, although with the increase in consumers' income levels, the scrutiny of the accuracy of news about GM food has risen, still, a greater number of consumers choose not to verify. When they are differentiated by whether or not have children to look after, consumers who have children to look after are a little bit more concerned about the accuracy of news related to GM food.

Q10: Do you think GM food is safe?

Table 16

Safety	Number of Interviewees	Percentage
Yes	0	0.0
May be	74	18.8
May be Not	198	50.4
No	80	20.4
Don't Know	41	10.4
Total	393	100.0

Chart 4

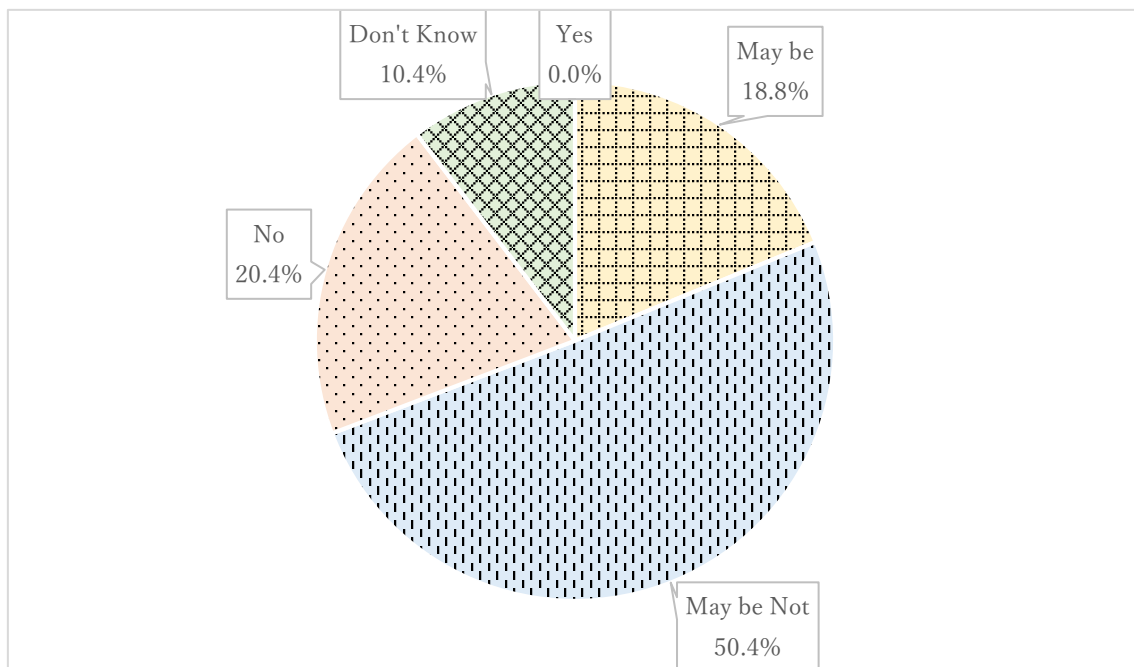


Table 17

Safety	Yes	May be	May be Not	No	Don't Know	Total
Number of Interviewees	0	74	198	80	41	393
Percentage	0.0	18.8	50.4	20.4	10.4	100.0
Northern Parts	0	40	96	54	9	199
Percentage	0.0	20.1	48.2	27.1	4.5	99.9
Southern Parts	0	28	74	21	7	130
Percentage	0.0	21.5	56.9	16.2	5.4	100.0
Inner Mongolia & Xinjiang	0	6	28	5	25	64
Percentage	0.0	9.4	43.8	7.8	39.0	100.0
Male	0	41	97	26	15	179
Percentage	0.0	22.9	54.2	14.5	8.4	100.0
Female	0	33	101	54	26	214
Percentage	0.0	15.4	47.2	25.2	12.1	99.9
Youth	0	38	33	13	1	85
Percentage	0.0	44.7	38.8	15.3	1.2	100.0
Middle-age	0	33	111	36	7	187
Percentage	0.0	17.6	59.4	19.3	3.7	100.0
Elderly	0	3	54	31	33	121
Percentage	0.0	2.5	44.6	25.6	27.3	100.0
Primary Education	0	1	1	3	28	33
Percentage	0.0	3.0	3.0	9.1	84.8	99.9
Secondary Education	0	2	6	34	9	51
Percentage	0.0	3.9	11.8	66.7	17.6	100.0
Tertiary Education	0	71	191	43	4	309
Percentage	0.0	23.0	61.8	13.9	1.3	100.0
1,000-5,000 Yuan	0	3	45	30	31	109
Percentage	0.0	2.8	41.3	27.5	28.4	100.0
5,000-10,000 Yuan	0	36	99	41	7	183
Percentage	0.0	19.7	54.1	22.4	3.8	100.0
Over 10,000 Yuan	0	35	54	9	3	101
Percentage	0.0	34.7	53.5	8.8	3.0	100.0

Consumers' Attitudes Towards GM Food in China

Have Children	0	23	86	33	24	166
Percentage	0.0	13.9	51.8	19.8	14.5	100.0
Don't Have Children	0	51	112	47	17	227
Percentage	0.0	22.5	49.3	20.7	7.5	100.0

As regards the place of habitual residence, among those who are living in the northern parts of China, 0.0% said they think GM food is safe, 20.1% said they think GM food may be safe, 48.2% said they think GM food may not be safe, 27.1% said they don't think GM food is safe, and 4.5% said they don't know. Among those who are in the southern parts, 0.0% think safe, 21.5% may be, 56.9% may not be, 16.2% unsafe, and 5.4% don't know. Among those who are in Inner Mongolia and Xinjiang, 0.0% think safe, 9.4% may be, 43.8% may not be, 7.8% unsafe, and 39.0% don't know.

As regards gender, among those who said they are males, 0.0% think safe, 22.9% may be, 54.2% may not be, 14.5% unsafe, and 8.4% don't know. Among those who said they are females, 0.0% think safe, 15.4% may be, 47.2% may not be, 25.2% unsafe, and 12.1% don't know.

As regards age, among those who are young, 0.0% think safe, 44.7% may be, 38.8% may not be, 15.3% unsafe, and 1.2% don't know. Among those who are middle-aged, 0.0% think safe, 17.6% may be, 59.4% may not be, 19.3% unsafe, and 3.7% don't know. Among those who are elderly, 0.0% think safe, 2.5% may be, 44.6% may not be, 25.6% unsafe, and, 27.3% don't know.

As regards the level of education, among those who have attained primary education or less,

Consumers' Attitudes Towards GM Food in China

0.0% think safe, 3.0% may be, 3.0% may not be, 9.1% unsafe, and 84.8% don't know. Among those who have attained up to the secondary level, 0.0% think safe, 3.9% may be, 11.8% may not be, 66.7% unsafe, and 17.6% don't know. Among those who have attained the tertiary level or more, 0.0% think safe, 23.0% may be, 61.8% may not be, 13.9% unsafe, and 1.3% don't know.

As regards the level of income, no respondents earned less than 1,000 Yuan a month. Among those who earned from 1,000 to 5,000 Yuan, 0.0% think safe, 2.8% may be, 41.3% may not be, 27.5% unsafe, and 28.4% don't know. Among those who earned from 5,000 to 10,000 Yuan, 0.0% think safe, 19.7% may be, 54.1% may not be, 22.4% unsafe, and 3.8% don't know. Among those who earned over 10,000 Yuan, 0.0% think safe, 34.7% may be, 53.5% may not be, 8.9% unsafe, and 3.0% don't know.

As regards whether or not they have children to look after, among those who have children to look after, 0.0% think safe, 13.9% may be, 51.8% may not be, 19.8% unsafe, and 14.5% don't know. Among those who do not have children to look after, 0.0% think safe, 22.5% may be, 49.3% may not be, 20.7% unsafe, and 7.5% don't know.

For the affective component of the attitude toward GM food, according to question 10, consumers don't feel very confident about safety in China. When respondents are differentiated by their places of habitual residence, more consumers who are in Inner Mongolia and Xinjiang don't know GM food whether is safe. When they are differentiated by gender, both of them don't feel very confident about the safety of GM food, but the males' attitude is more positive than the females. When they are differentiated by age, young people

tend to hold a more optimistic attitude towards the safety of GM food compared to middle-aged and elderly consumers. Elderly consumers tend to express a stronger skepticism and negativity toward the safety of GM food. When they are differentiated by education level, consumers with higher levels of education tend to hold a more optimistic attitude toward the safety of GM food. Consumers with lower levels of education tend to harbor stronger skepticism toward the safety of GM food. When they are differentiated by income level, the higher the income consumers have, the more positive the attitude toward the safety of GM food; conversely, the lower the income consumers have, the stronger the tendency to hold a negative attitude toward the safety of GM food. When they are differentiated by whether or not have children to look after, consumers who don't have children to look after tend to hold a more positive attitude towards the safety of GM food compared to those who have children to look after.

Q11: Do you support GM foods entering into the consumer market?

Table 18

For or Against	Number of Interviewees	Percentage
Strongly Support	0	0.0
Support	27	6.9
Neutral	161	41.0
Against	183	46.5
Strongly Against	22	5.6
Total	393	100.0

Chart 5

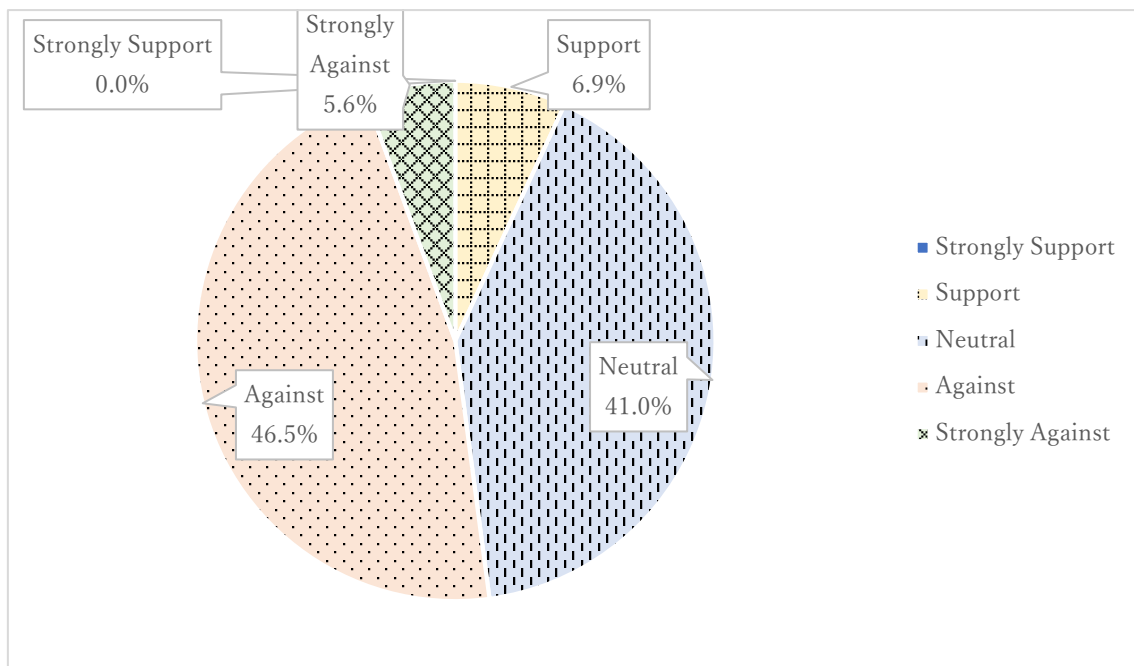


Table 19

Enter The Market	Strongly Support	Support	Neutrality	Against	Strongly Against	Total
Number of Interviewees	0	27	161	183	22	393
Percentage	0.0	6.9	41.0	46.5	5.6	100.0

Consumers' Attitudes Towards GM Food in China

Northern Parts	0	15	74	95	15	199
Percentage	0.0	7.5	37.2	47.7	7.5	99.9
Southern Parts	0	11	53	62	4	130
Percentage	0.0	8.5	40.8	47.7	3.0	100.0
Inner Mongolia & Xinjiang	0	1	34	26	3	64
Percentage	0.0	1.6	53.1	40.6	4.7	100.0
Male	0	15	76	77	11	179
Percentage	0.0	8.4	42.5	43.0	6.1	100.0
Female	0	12	85	106	11	214
Percentage	0.0	5.6	39.7	49.5	5.1	99.9
Youth	0	9	47	25	4	85
Percentage	0.0	10.6	55.3	29.4	4.7	100.0
Middle-age	0	16	84	82	5	187
Percentage	0.0	8.6	44.9	43.9	2.6	100.0
Elderly	0	2	30	76	13	121
Percentage	0.0	1.7	24.8	62.8	10.7	100.0
Primary Education	0	2	8	13	10	33
Percentage	0.0	6.1	24.2	39.4	30.3	100.0
Secondary Education	0	6	28	10	7	51
Percentage	0.0	11.8	54.9	19.6	13.7	100.0
Tertiary Education	0	19	125	160	5	309
Percentage	0.0	6.1	40.5	51.8	1.6	100.0
1,000-5,000 Yuan	0	2	19	77	11	109
Percentage	0.0	1.8	17.4	70.6	10.1	99.9
5,000-10,000 Yuan	0	7	92	76	8	183
Percentage	0.0	3.8	50.3	41.5	4.4	100.0
Over 10,000 Yuan	0	18	50	30	3	101
Percentage	0.0	17.8	49.5	29.7	3.0	100.0
Have Children	0	9	58	89	10	166
Percentage	0.0	5.4	34.9	53.6	6.0	99.9
Don't Have Children	0	18	103	94	12	227
Percentage	0.0	7.9	45.4	41.4	5.3	100.0

As regards the place of habitual residence, among those who are living in the northern parts of China, 0.0% said they strongly support GM food entering into the consumer market, 7.5% said they support it, 37.2% said they are neutral, 47.7% said they against, and 7.5% said they strongly against. Among those who are in the southern parts, 0.0% strongly support, 8.5% support, 40.8% neutrality, 47.7% against, and 3.0% strongly against. Among those who are in Inner Mongolia and Xinjiang, 0.0% strongly support, 1.6% support, 53.1% neutrality, 40.6% against, and 4.7% strongly against.

As regards gender, among those who said they are males, 0.0% strongly support, 8.4% support, 42.5% neutrality, 43.0% against, and 6.1% strongly against. Among those who said they are females, 0.0% strongly support, 5.6% support, 39.7% neutrality, 49.5% against, and 5.1% strongly against.

As regards age, among those who are the youth, 0.0% strongly support, 10.6% support, 55.3% neutrality, 29.4% against, and 4.7% strongly against. Among those who are middle-aged, 0.0% strongly support, 8.6% support, 44.9% neutrality, 43.9% against, and 2.6% strongly against. Among those who are the elderly, 0.0% strongly support, 1.7% support, 24.8% neutrality, 62.8% against, and 10.7% strongly against.

As regards the level of education, among those who have attained primary education or less, 0.0% strongly support, 6.1% support, 24.2% neutrality, 39.4% against, and 30.3% strongly against. Among those who have attained up to the secondary level, 0.0% strongly support, 11.8% support, 54.9% neutrality, 19.6% against, and 13.7% strongly against. Among those who have attained the tertiary level or more, 0.0% strongly support, 6.1% support, 40.5%

neutrality, 51.8% against, and 1.6% strongly against.

As regards the level of income, among those who earned from 1,000 to 5,000 Yuan, 0.0% strongly support, 1.8% support, 17.4% neutrality, 70.6% against, and 10.1% strongly against.

Among those who earned from 5,000 to 10,000 Yuan, 0.0% strongly support, 3.8% support, 50.3% neutrality, 41.5% against, and 4.4% strongly against. Among those who earned over 10,000 Yuan, 0.0% think safe, 0.0% strongly support, 17.8% support, 49.5% neutrality, 29.7% against, and 3.0% strongly against.

As regards whether have children to look after, among those who have children to look after, 0.0% strongly support, 5.4% support, 34.9% neutrality, 53.6% against, and 6.0% strongly against. Among those who do not have children to look after, 0.0% strongly support, 7.9% support, 45.4% neutrality, 41.4% against, and 5.3% strongly against.

For the behavioral component of the attitude toward GM food, according to question 11, no consumer strongly supports the entry of GM food into the market, only a minority of consumers support it, nearly half remain neutral, and over half do not support it, with a portion of them strongly opposing the introduction of GM food into the market. When respondents are differentiated by their places of habitual residence, while there is minimal support for the entry of GM food into the market in each region, the number of supporters is higher in the southern and northern regions compared to Inner Mongolia and Xinjiang. Moreover, in the southern and northern regions, the number of consumers opposing GM food is greater than those with a neutral stance, whereas, in Inner Mongolia and Xinjiang, there are more consumers with a neutral stance than those opposing. When they are differentiated by

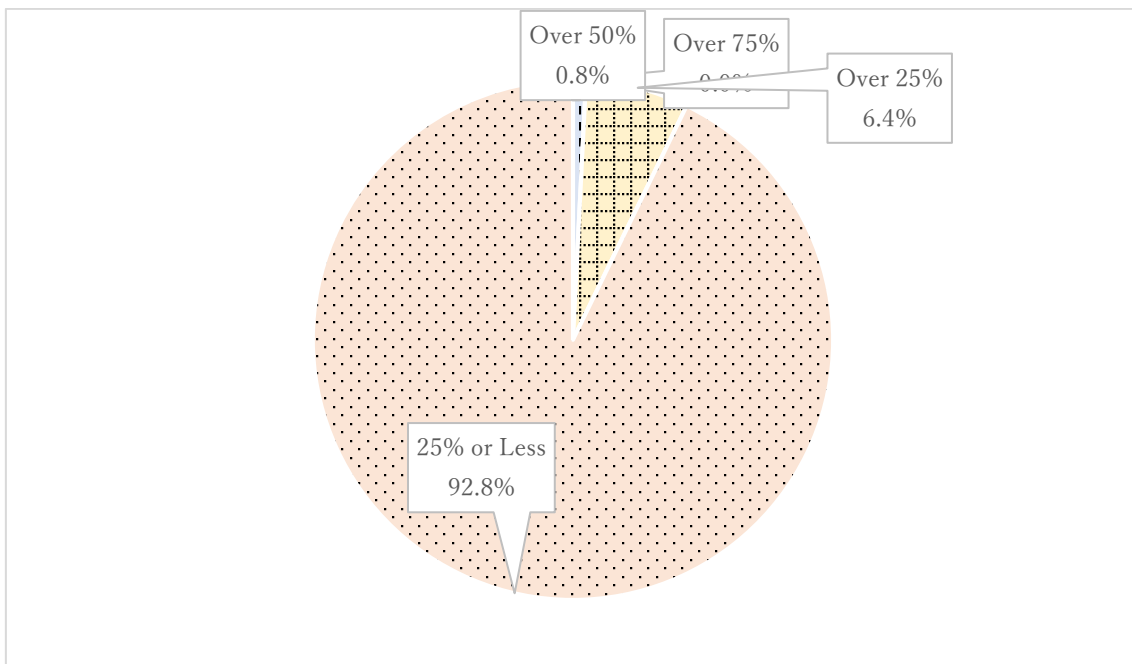
gender, the support rate among males is slightly higher than that among females but still constitutes a small percentage of the population. Males tend to hold a more optimistic attitude towards the entry of GM food into the market compared to females. When they are differentiated by age, The younger the age, the more positive the attitude toward the entry of GM food into the market. Elderly consumers exhibit a stronger opposition compared to middle-aged and younger consumers. When they are differentiated by education level, contrary to the results regarding the safety of GM food, consumers with a moderate level of education are more supportive of the entry of GM food into the market, although the percentage is still relatively small. Consumers with a primary level of education still hold a negative attitude toward the entry of genetically modified foods into the market. When they are differentiated by income level, consumers with higher income levels tend to hold a more positive attitude toward the entry of GM food into the market. When they are differentiated by whether or not have children to look after, consumers who don't have children to look after tend to be slightly more positive towards the entry of GM food into the market compared to those with children, but supporters still constitute a minority.

Q12: How much percentage of GM foods do you think you consume in your daily diet?

Table 20

Percentage of GM Food	Number of Interviewees	Percentage
Over 75%	0	0.0
Over 50%	3	0.8
Over 25%	25	6.4
25% or Less	365	92.8
Total	393	100.0

Chart 6



Consumers' Attitudes Towards GM Food in China

Table 21

Percentage of GM Food	Over 75%	Over 50%	Over 25%	25% or Less	Total
Number of Interviewees	0	3	25	365	393
Percentage	0.0	0.8	6.4	92.8	100.0
Northern Parts	0	2	17	180	199
Percentage	0.0	1.0	8.5	90.5	100.0
Southern Parts	0	1	8	121	130
Percentage	0.0	0.8	6.2	93.0	100.0
Inner Mongolia & Xinjiang	0	0	0	64	64
Percentage	0.0	0.0	0.0	100.0	100.0
Male	0	2	11	166	179
Percentage	0.0	1.1	6.1	92.7	99.9
Female	0	1	14	199	214
Percentage	0.0	0.5	6.5	93.0	100.0
Youth	0	0	12	73	85
Percentage	0.0	0.0	14.1	85.9	100.0
Middle-age	0	3	9	175	187
Percentage	0.0	1.6	4.8	93.6	100.0
Elderly	0	0	4	117	121
Percentage	0.0	0.0	3.3	96.7	100.0
Primary Education	0	0	0	33	33
Percentage	0.0	0.0	0.0	100.0	100.0
Secondary Education	0	0	1	50	51
Percentage	0.0	0.0	2.0	98.0	100.0
Tertiary Education	0	3	24	282	309
Percentage	0.0	1.0	7.8	91.3	100.1
1,000-5,000 Yuan	0	0	0	109	109
Percentage	0.0	0.0	0.0	100.0	100.0
5,000-10,000 Yuan	0	1	8	174	183
Percentage	0.0	0.5	4.4	95.1	100.0
Over 10,000 Yuan	0	2	17	82	101
Percentage	0.0	2.0	16.8	81.2	100.0
Have Children	0	0	2	164	166
Percentage	0.0	0.0	1.2	98.8	100.0
Don't Have Children	0	3	23	201	227
Percentage	0.0	1.3	10.1	88.5	99.9

As regards the place of habitual residence, among those who are living in the northern parts of China, 0.0% said they think over 75% of GM food consumed in their daily life, 1.0% said over 50%, 8.5% said over 25%, 90.5% said 25% or less. Among those who are in the southern parts, 0.0% over 75%, 0.8% over 50%, 6.2% over 25%, and 93.0% 25% or less. Among those who are in Inner Mongolia and Xinjiang, 0.0% over 75%, 0.0% over 50%, 0.0% over 5%, and 100.0% 25% or less.

As regards gender, among those who said they are males, 0.0% over 75%, 1.1% over 50%, 6.1% over 25%, 92.7% 25% or less. Among those who said they are females, 0.0% over 75%, 0.5% over 50%, 6.5% over 25%, and 93.0% 25% or less.

As regards age, among those who are youth, 0.0% are over 75%, 0.8% are over 50%, 14.1% are over 25%, and 85.9% are 25% or less. Among those who are middle-aged, 0.0% are over 75%, 1.6% are over 50%, 4.8% are over 5%, and 93.6% are 25% or less. Among those who are elderly, 0.0% over 75%, 0.0% over 50%, 3.3% over 5%, and 96.7% 25% or less.

As regards the level of education, among those who have attained primary education or less, 0.0% over 75%, 0.0% over 50%, 0.0% over 5%, and 100.0% 25% or less. Among those who have attained up to the secondary level, 0.0% over 75%, 0.0% over 50%, 2.0% over 5%, and 98.0% 25% or less. Among those who have attained the tertiary level or more, 0.0% over 75%, 1.0% over 50%, 7.8% over 5%, and 91.3% 25% or less.

As regards the level of income, among those who earned from 1,000 to 5,000 Yuan, 0.0% over 75%, 0.0% over 50%, 0.0% over 5%, and 100.0% 25% or less. Among those who earned from 5,000 to 10,000 Yuan, 0.0% over 75%, 0.5% over 50%, 4.4% over 5%, and 95.1% 25%

or less. Among those who earned over 10,000 Yuan, 0.0% over 75%, 2.0% over 50%, 16.8% over 5%, and 81.2% 25% or less.

As regards whether have children to look after, among those who have children to look after, 0.0% over 75%, 0.0% over 50%, 1.2% over 5%, and 98.8% 25% or less. Among those who do not have children to look after, 0.0% over 75%, 1.3% over 50%, 10.1% over 5%, and 88.5% 25% or less.

For the behavioral component of the attitude toward GM food, according to question 12, over 90% of consumers believe that the proportion of GM food in their daily consumption is less than or equal to 25%. Consumers still tend to avoid purchasing GM food. When respondents are differentiated by their places of habitual residence, Consumers in Inner Mongolia and Xinjiang express confidence in having less than or equal to 25% of GM food in their daily consumption, and they are not inclined to buy GM food. Consumers in the southern and northern regions are not as confident as those in Inner Mongolia and Xinjiang, although they are also not inclined to purchase GM food. When they are differentiated by gender, the confidence level of males and females regarding the proportion of GM food in their daily consumption being less than or equal to 25% is similar. When they are differentiated by age, Middle-aged consumers express a higher confidence level in having a larger proportion of GM food in their daily consumption compared to consumers in other age groups. Older consumers are more confident in having a smaller proportion of genetically modified foods in their consumption. When they are differentiated by education level, consumers with higher levels of education tend to have a relatively higher proportion of GM

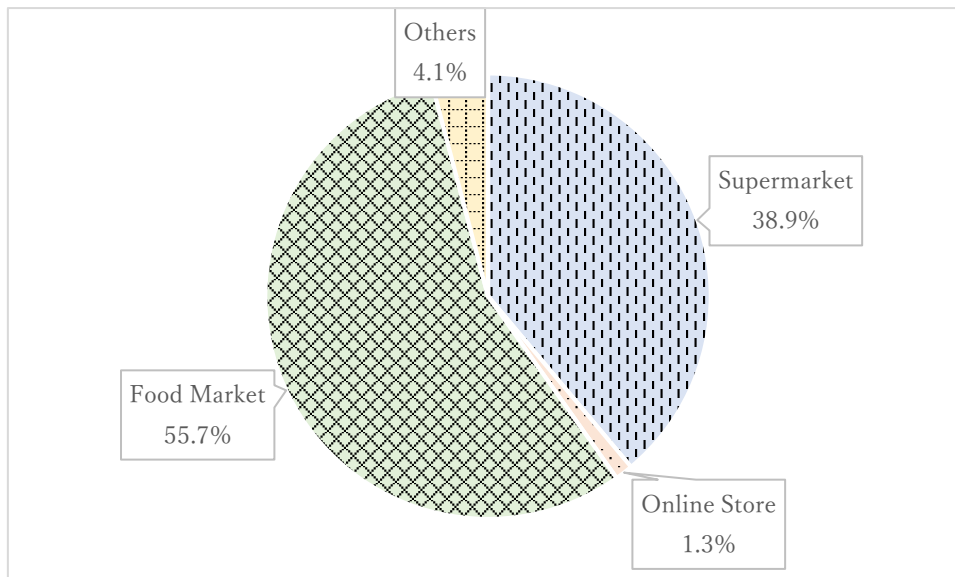
food in their daily consumption. When they are differentiated by income level, the result is similar to the education level, consumers with higher income levels tend to have a relatively higher proportion of GM food in their daily consumption. When they are differentiated by whether or not have children to look after, consumers who don't have children to look after tend to have a slightly higher proportion of GM food in their daily consumption compared to consumers who have children to look after.

Q13: Where do you usually go to buy food?

Table 22

Where Buy Food	Number of Interviewees	Percentage
Supermarket	153	38.9
Online Store	5	1.3
Food Market	219	55.7
Others	16	4.1
Total	393	100.0

Chart 7



38.9% of respondents usually go to the supermarket and its online shop to buy food, 1.3% usually buy food on the online store, 55.7% usually buy food in food markets, and 4.1% buy food in other ways. From these, consumers tend to buy food in food markets.

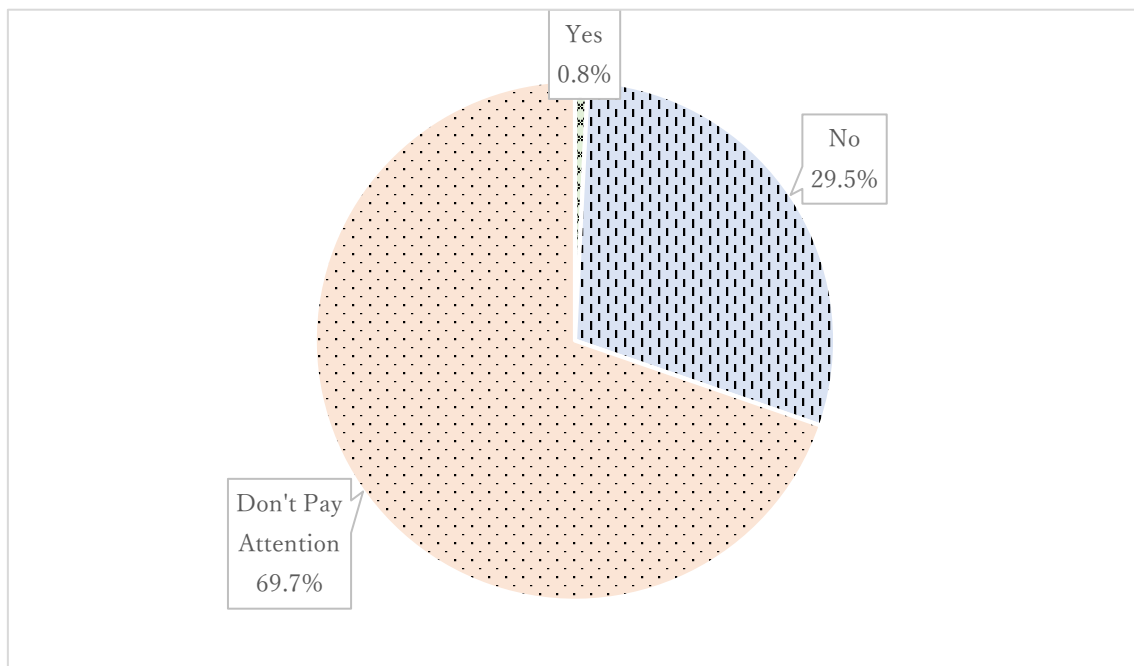
For the behavioral component of the attitude toward GM food, according to question 13, consumers tend to buy food in physical stores, especially food markets and supermarkets.

Q14: Have you ever bought food that is clearly labeled or packaged as GMO?

Table 23

Buy GM Food	Number of Respondents	Percentage
Yes	3	0.8
No	116	29.5
Don't Pay Attention	274	69.7
Total	393	100.0

Chart 8



Consumers' Attitudes Towards GM Food in China

Table 24

Buy GM Food	Yes	No	Don't Pay Attention	Total
Number of Interviewees	3	116	274	393
Percentage	0.8	29.5	69.7	100.0
Northern Parts	2	46	151	199
Percentage	1.0	23.1	75.9	100.0
Southern Parts	1	67	62	130
Percentage	0.8	51.5	47.7	100.0
Inner Mongolia & Xinjiang	0	3	61	64
Percentage	0.0	4.7	95.3	100.0
Male	2	49	128	179
Percentage	1.1	27.4	71.5	100.0
Female	1	67	146	214
Percentage	0.5	31.3	68.2	100.0
Youth	1	37	47	85
Percentage	1.2	43.5	55.3	100.0
Middle-age	2	51	134	187
Percentage	1.1	27.3	71.6	100.0
Elderly	0	28	93	121
Percentage	0.0	23.1	76.9	100.0
Primary Education	0	7	26	33
Percentage	0.0	21.2	78.8	100.0
Secondary Education	0	18	33	51
Percentage	0.0	35.3	64.7	100.0
Tertiary Education	3	91	215	309
Percentage	1.0	29.4	69.6	100.0
1,000-5,000 Yuan	0	24	85	109
Percentage	0.0	22.0	78.0	100.0
5,000-10,000 Yuan	0	42	141	183
Percentage	0.0	23.0	77.0	100.0
Over 10,000 Yuan	3	50	48	101
Percentage	3.0	49.5	47.5	100.0
Have Children	0	71	95	166
Percentage	0.0	42.8	57.2	100.0
Don't Have Children	3	45	179	227
Percentage	1.3	19.8	78.9	100.0

As regards the place of habitual residence, among those who are living in the northern parts of China, 1.0% said they have bought GM food, 23.1% said they have never bought GM food, and 75.9% said they didn't pay attention. Among those who are in the southern parts, 0.8% bought, 51.5% never, and 47.7% didn't pay attention. Among those who are in Inner Mongolia and Xinjiang, 0.0% bought, 4.7% never, and 95.3% didn't pay attention.

As regards gender, among those who said they are males, 1.1% bought, 27.4% never, and 71.5% didn't pay attention. Among those who said they are females, 0.5% bought, 31.3% never, and 68.2% didn't pay attention.

As regards age, among those who are the youth, 1.2% bought, 43.5% never, and 55.3% didn't pay attention. Among those who are middle-aged, 1.1% bought, 27.3% never, and 71.6% didn't pay attention. Among those who are elderly, 0.0% bought, 23.1% never, and 76.9% didn't pay attention.

As regards the level of education, among those who have attained primary education or less, 0.0% bought, 21.2% never, and 78.8% didn't pay attention. Among those who have attained up to the secondary level, 0.0% bought, 35.3% never, and 64.7% didn't pay attention. Among those who have attained the tertiary level or more, 1.0 % bought, 29.4% never, and 69.6% didn't pay attention.

As regards the level of income, among those who earned from 1,000 to 5,000 Yuan, 0.0% bought, 22.0% never, and 78.0% didn't pay attention. Among those who earned from 5,000 to 10,000 Yuan, 0.0% bought, 23.0% never, and 77.0% didn't pay attention. Among those who earned over 10,000 Yuan, 3.0% bought, 49.5% never, and 47.5% didn't pay attention.

As regards whether have children to look after, among those who have children to look after, 0.0% bought, 42.8% never, and 57.2% didn't pay attention. Among those who do not have children to look after, 1.3% bought, 19.8% never, and 78.9% didn't pay attention.

For the cognitive component and behavioral components of the labeling regulations of GM food, according to question 14, over half of the consumers do not pay attention to whether there is any mention of GMOs on product labels or packaging when making purchases. Only a small fraction of consumers have intentionally purchased food products labeled as GMO. When respondents are differentiated by their places of habitual residence, among consumers in the southern and northern regions, some consumers intentionally purchase GM food, but the majority still do not actively buy it. The awareness of checking labels or packaging before making a purchase is higher among Southern consumers than Northern consumers. Consumers in Inner Mongolia and Xinjiang, on the other hand, are less likely to actively buy GM food, and the awareness of checking labels or packaging is even less prevalent. When they are differentiated by gender, compared to males, females are less willing to purchase GM food, and males are less likely to pay attention to packaging or labeling. When they are differentiated by age, younger consumers tend to be more concerned about packaging or labeling compared to middle-aged and elderly consumers. Among younger and middle-aged consumers, some consumers are willing to accept and actively purchase GM food, but this constitutes only a small fraction. When they are differentiated by education level, consumers with higher education levels are more accepting and willing to actively purchase GM food. However, a significant portion of consumers, even among those with higher education, do not pay

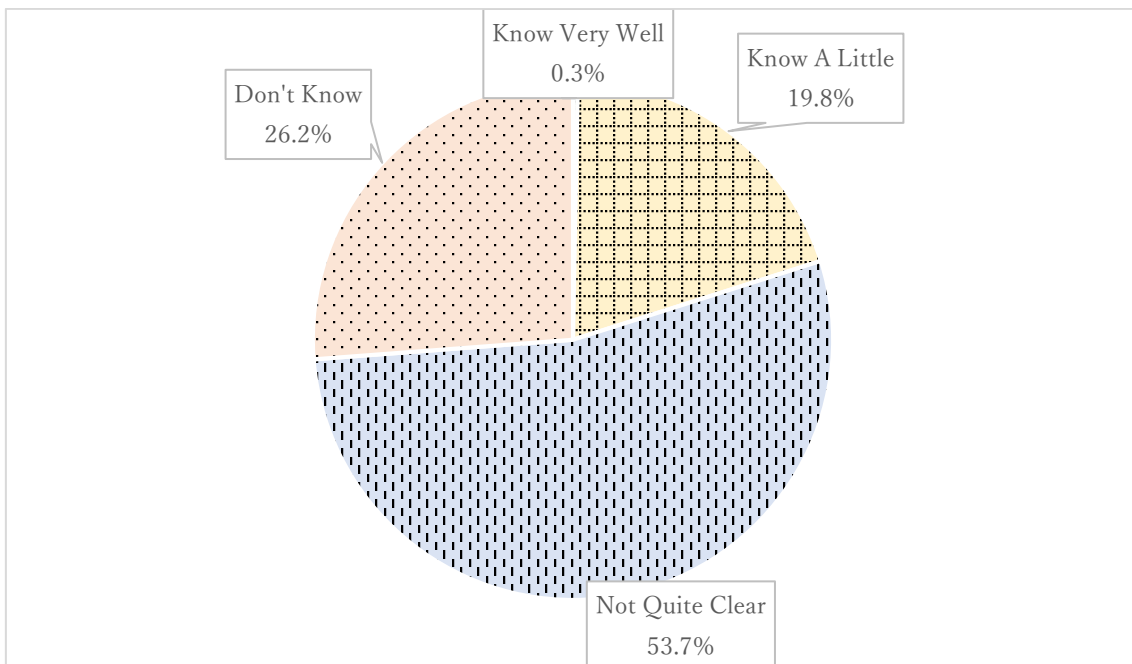
attention to packaging or labeling. Those with secondary education levels tend to be more attentive to packaging and labeling. When they are differentiated by income level, The higher the income of consumers, the more they pay attention to food packaging and labeling. Among them, consumers with a monthly income of over 10,000 yuan are particularly attentive to packaging and labeling, and some are willing to purchase GM food. When they are differentiated by whether or not have children to look after, consumers who have children to look after pay more attention to food packaging and labeling, while among consumers who don't have children to look after, some consumers are willing to purchase GM food.

Q15: Do you know the Regulations for the management of the labeling of agricultural genetically modified organisms?

Table 25

Know GM Food Labeling	Number of Interviewees	Percentage
Know Very Well	1	0.3
Know A Little Bit	78	19.8
Not Quite Clear	211	53.7
Don't Know	103	26.2
Total	393	100.0

Chart 9



Consumers' Attitudes Towards GM Food in China

Table 26

Know GM Food Labeling	Know Very Well	Know A Little Bit	Not Quite Clear	Don't Know	Total
Number of Interviewees	1	78	211	103	393
Percentage	0.3	19.8	53.7	26.2	100.0
Northern Parts	0	34	117	48	199
Percentage	0.0	17.1	58.8	24.1	100.0
Southern Parts	1	36	75	18	130
Percentage	0.8	27.7	57.7	13.8	100.0
Inner Mongolia & Xinjiang	0	8	19	37	64
Percentage	0.0	12.5	29.7	57.8	100.0
Male	1	36	93	49	179
Percentage	0.6	20.1	52.0	27.4	100.1
Female	0	42	118	54	214
Percentage	0.0	19.6	55.1	25.2	99.9
Youth	0	23	39	23	85
Percentage	0.0	27.1	45.9	27.1	100.0
Middle-age	1	43	104	39	187
Percentage	0.5	23.0	55.6	20.9	100.0
Elderly	0	12	68	41	121
Percentage	0.0	9.9	56.2	33.9	100.0
Primary Education	0	2	10	21	33
Percentage	0.0	6.1	30.3	63.6	100.0
Secondary Education	0	9	17	25	51
Percentage	0.0	17.6	33.3	49.0	99.9
Tertiary Education	1	67	184	57	309
Percentage	0.3	21.7	59.5	18.4	99.9
1,000-5,000 Yuan	0	4	58	47	109
Percentage	0.0	3.7	53.2	43.1	100.0
5,000-10,000 Yuan	1	27	114	41	183
Percentage	0.5	14.8	62.3	22.4	100.0
Over 10,000 Yuan	0	47	39	15	101
Percentage	0.0	46.5	38.6	14.9	100.0
Have Children	0	36	101	29	166
Percentage	0.0	21.7	60.8	17.5	100.0
Don't Have Children	1	42	110	74	227
Percentage	0.4	18.5	48.5	32.6	100.0

As regards the place of habitual residence, among those who are living in the northern parts of China, 0.0% said they know the labeling regulation of GM food very well, 17.1% said they know a little, 58.8% said they don't quite clear, and 24.1% said they don't know. Among those who are in the southern parts, 0.8% are well, 27.7% a little, 57.7% unclear, and 13.8% don't know. Among those who are in Inner Mongolia and Xinjiang, 0.0% are well, 12.5% a little, 29.7% unclear, and 57.8% don't know.

As regards gender, among those who said they are males, 0.6% are well, 20.1% a little, 52.0% unclear, and 27.4% don't know. Among those who said they are females, 0.0% are well, 19.6% a little, 55.1% unclear, and 25.2% don't know.

As regards age, among those who are the youth, 0.0% are well, 27.1% a little, 45.9% unclear, and 27.1% don't know. Among those who are middle-aged, 0.5% are well, 23.0% a little, 55.6% unclear, and 20.9% don't know. Among those who are elderly, 0.0% are well, 9.9% a little, 56.2% unclear, and 33.9% don't know.

As regards the level of education, among those who have attained primary education or less, 0.0% are well, 6.1% a little, 30.3% unclear, and 63.6% don't know. Among those who have attained up to the secondary level, 0.0% are well, 17.6% a little, 33.3% unclear, and 49.0% don't know. Among those who have attained the tertiary level or more, 0.3% are well, 21.7% a little, 59.5% unclear, and 18.4% don't know.

As regards the level of income, among those who earned from 1,000 to 5,000 Yuan, 0.0% are well, 3.7% a little, 53.2% unclear, and 43.1% don't know. Among those who earned from 5,000 to 10,000 Yuan, 0.5% are well, 14.8% a little, 62.3% unclear, and 22.4% don't know.

Among those who earned over 10,000 Yuan, 0.0% are well, 46.5% a little, 38.6% unclear, and 14.9% don't know.

As regards whether have children to look after, among those who have children to look after, 0.0% are well, 21.7% a little, 60.8% unclear, and 17.5% don't know. Among those who do not have children to look after, 0.4% are well, 18.5% a little, 48.5% unclear, and 32.6% don't know.

For the cognitive component of the labeling regulations of GM food, according to question 15, most people don't know about the labeling regulations of GM food well in China. When respondents are differentiated by their places of habitual residence, consumers in the southern region are more confident in their knowledge of GM food labeling regulations, while consumers in Inner Mongolia and Xinjiang are less clear about it. When they are differentiated by gender, male consumers are more confident in their knowledge of GM food labeling regulations compared to female consumers. When they are differentiated by age, younger consumers and middle-aged consumers are more confident in their knowledge of GM food labeling regulations. When they are differentiated by education level, consumers with higher education levels are more confident in their knowledge of GM food labeling regulations. When they are differentiated by income level, consumers with higher incomes are more confident in their knowledge of GM food labeling regulations. When they are differentiated by whether or not have children to look after, consumers who have children to look after are slightly more confident in their knowledge of GM food labeling regulations compared to those who don't have children to look after, but it does not rule out the presence of interest among consumers

who don't have children to look after.

Q16: Do you look at the food label or package when shopping to see if it contains GMO ingredients?

Table 27

See Label	Number of Interviewees	Percentage
Always	96	24.4
Often	88	22.4
Sometimes	81	20.6
Rarely	76	19.3
Never	52	13.2
Total	393	99.9

Chart 10

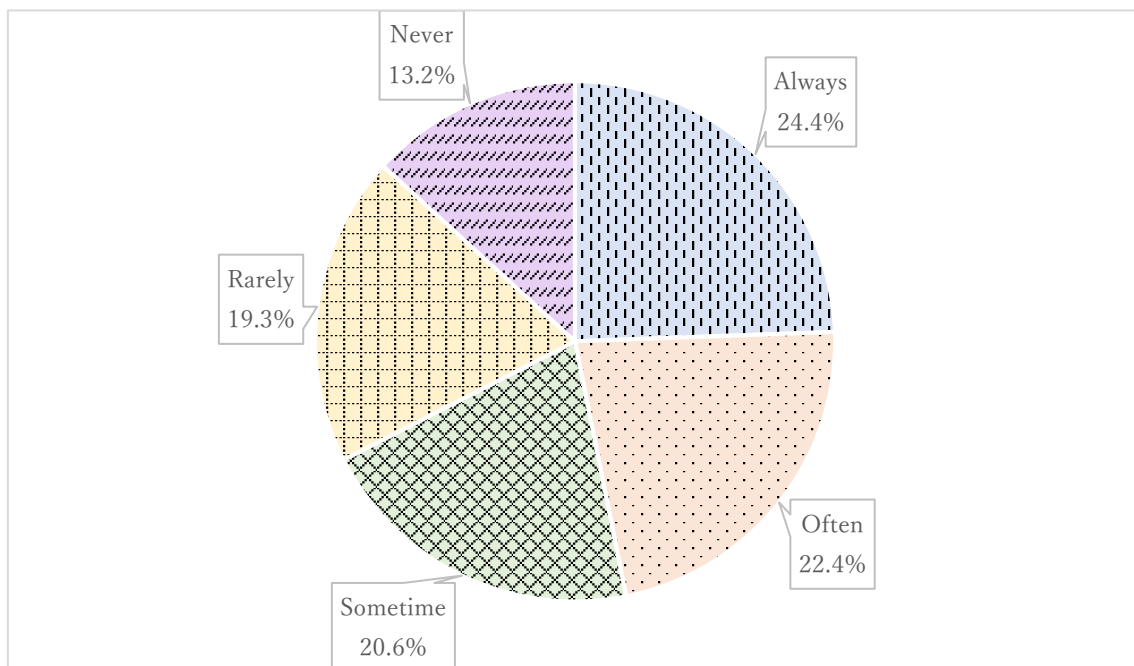


Table 28

See Label	Always	Often	Sometimes	Rarely	Never	Total
Number of Interviewees	96	88	81	76	52	393
Percentage	24.4	22.4	20.6	19.3	13.2	99.9
Northern Parts	56	54	46	27	16	199
Percentage	28.1	27.1	23.1	13.6	8.0	99.9
Southern Parts	37	29	30	16	18	130
Percentage	28.5	22.3	23.1	12.3	13.8	100.0
Inner Mongolia & Xinjiang	3	5	5	33	18	64
Percentage	4.7	7.8	7.8	51.6	28.1	100.0
Male	39	31	31	43	35	179
Percentage	21.8	17.3	17.3	24.0	19.6	100.0
Female	57	57	50	33	17	214
Percentage	26.6	26.6	23.4	15.4	7.9	99.9
Youth	8	15	29	21	12	85
Percentage	9.4	17.6	34.1	24.7	14.1	99.9
Middle-age	50	43	34	44	16	187
Percentage	26.7	23.0	18.2	23.5	8.6	100.0
Elderly	38	30	18	11	24	121
Percentage	31.4	24.8	14.9	9.1	19.8	100.0
Primary Education	0	0	2	5	26	33
Percentage	0.0	0.0	6.1	15.2	78.7	100.0
Secondary Education	2	4	13	22	10	51
Percentage	3.9	7.8	25.5	43.1	19.6	99.9
Tertiary Education	94	84	66	49	16	309
Percentage	30.4	27.2	21.4	15.9	5.2	100.1
1,000-5,000 Yuan	1	3	14	25	31	109
Percentage	0.9	2.8	12.8	22.9	28.4	99.8
5,000-10,000 Yuan	73	61	39	33	12	183
Percentage	39.9	33.3	21.3	18.0	6.6	99.9
Over 10,000 Yuan	22	24	28	18	9	101
Percentage	21.8	23.8	27.7	17.8	8.9	100.0
Have Children	55	41	34	31	5	166

Consumers' Attitudes Towards GM Food in China

Percentage	33.1	24.7	20.5	18.7	3.0	100.0
Don't Have Children	41	47	47	45	47	227
Percentage	18.1	20.7	20.7	19.8	20.7	100.0

As regards the place of habitual residence, among those who are living in the northern parts of China, 28.1% said they always look at the label or package, 27.1% said often, 23.1% said sometimes, 13.6% said rarely, and 8.0% said never. Among those who are in the southern parts, 28.5% always, 22.3% often, 23.1% sometimes, 12.3% rarely, and 13.8% never. Among those who are in Inner Mongolia and Xinjiang, 4.7% always, 7.8% often, 7.8% sometimes, 51.6% rarely, and 21.8% never.

As regards gender, among those who said they are males, 21.8% always, 17.3% often, 17.3% sometimes, 24.0% rarely, and 19.6% never. Among those who said they are females, 26.6% always, 26.6% often, 23.4% sometimes, 15.4% rarely, and 7.9% never.

As regards age, among those who are the youth, 9.4% always, 17.6% often, 34.1% sometimes, 24.7% rarely, and 14.1% never. Among those who are middle-aged, 26.7% always, 23.0% often, 18.2% sometimes, 23.5% rarely, and 8.6% never. Among those who are elderly, 31.4% always, 24.8% often, 14.9% sometimes, 9.1% rarely, and 19.8% never.

As regards the level of education, among those who have attained primary education or less, 0.0% always, 0.0% often, 6.1% sometimes, 15.2% rarely, and 78.7% never. Among those who have attained up to the secondary level, 3.9% always, 7.8% often, 25.5% sometimes, 43.1% rarely, and 19.6% never. Among those who have attained the tertiary level or more, 30.4% always, 27.2% often, 21.4% sometimes, 15.9% rarely, and 5.2% never.

As regards the level of income, among those who earned from 1,000 to 5,000 Yuan, 0.9% always, 2.8% often, 12.8% sometimes, 22.9% rarely, and 28.4% never. Among those who earned from 5,000 to 10,000 Yuan, 39.9% always, 33.3% often, 21.3% sometimes, 18.0% rarely, and 6.6% never. Among those who earned over 10,000 Yuan, 21.8% always, 23.8% often, 27.7% sometimes, 17.8% rarely, and 8.9% never.

As regards whether have children to look after, among those who have children to look after, 33.1% always, 24.7% often, 20.5% sometimes, 18.7% rarely, and 3.0% never. Among those who do not have children to look after, 18.1% always, 20.7% often, 20.7% sometimes, 19.8% rarely, and 20.7% never.

For the cognitive component and behavioral component of the labeling regulations of GM food, according to question 16, consumers are still quite concerned about whether the food they purchase contains GMO ingredients. Most people will check the packaging or labels to confirm whether the product contains GMO ingredients. When respondents are differentiated by their places of habitual residence, consumers in Inner Mongolia and Xinjiang are not accustomed to checking packaging or labels when shopping to determine whether they contain GMO ingredients. Consumers in the southern and northern regions pay more attention to this, and the level of attention is similar between southern and northern consumers. When they are differentiated by gender, female consumers are more concerned than male consumers about whether the food they purchase contains GMO ingredients. They also tend to check packaging or labels more frequently. When they are differentiated by age, the older the consumers, the higher the frequency of checking packaging or labels to confirm

whether the product contains GMO ingredients. When they are differentiated by education level, the higher the education level of consumers, the more likely they are to check packaging or labels to confirm whether the product contains GMO ingredients. When they are differentiated by income level, consumers with moderate income (5,000-10,000 yuan) tend to check packaging or labels more frequently than other consumers to confirm whether the product contains GMO ingredients. They are more concerned about the ingredients of the food they purchase. When they are differentiated by whether or not have children to look after, consumers who have children to look after are more likely to check the packaging or labels to confirm whether GMO ingredients are present. They are more concerned about whether the food contains GMO ingredients.

Q17: Do you know what "non-GMO" means on the label in the picture?

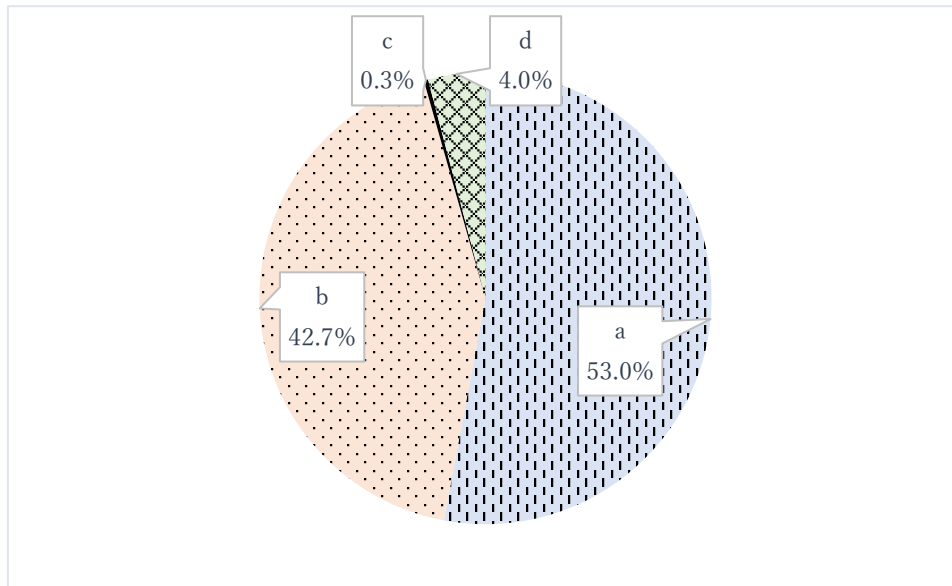


- All the materials are GM-Free.
- Some of the materials have GMO and non-GMO, this product didn't use GMO.
- The main materials are non-GMO.
- I don't know.

Table 29

'Non-GM Food' Label	Number of Interviewees	Percentage
a	208	53.0
b	168	42.7
c	1	0.3
d	16	4.0
Total	393	100.0

Chart 11



53.0% of respondents think the meaning of 'non-GMO' is all the materials are GM-free, 42.7% think that it means some of the materials have GMO and non-GMO, this product didn't use GMO, 0.3% think it means the main materials are non-GMO, and 4.1% don't know. Although over half of respondents think a is the right answer, the right answer is b. From these, many consumers lack the basic knowledge of 'non-GMO'.

For the cognitive component of the labeling regulations of GM food, according to question 17, less than half of the people chose the correct answer, and more than half of the consumers chose the misleading incorrect answer. This indicates that consumers have some knowledge about GMO and non-GMO but not comprehensive enough.

Q18: Do you know why the picture is not signed “non-GMO”?

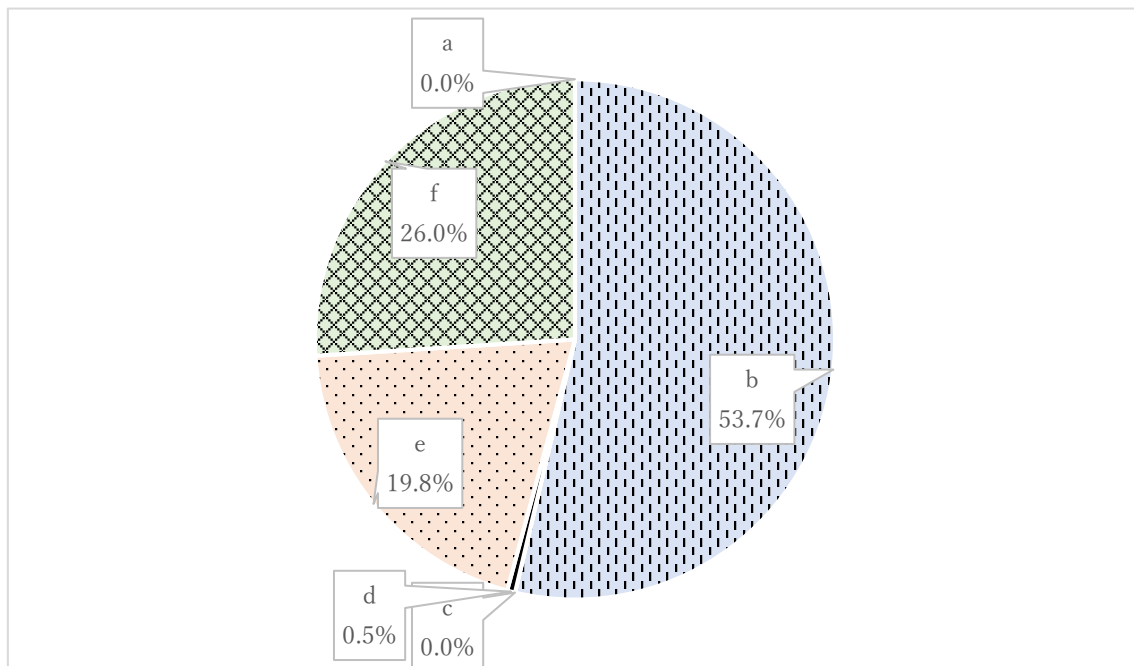


- a. All the materials are GMO.
- b. All the materials are non-GMO.
- c. The main materials are GMO.
- d. The main materials are non-GMO.
- e. The materials of this product do not have genetically modified organisms.
- f. I don't know.

Table 30

No 'Non-GM Food'	Number of Interviewees	Percentage
a	0	0.0
b	211	53.7
c	0	0.0
d	2	0.5
e	78	19.8
f	102	26.0
Total	393	100.0

Chart 12



53.7% of respondents think 'non-GMO' in the label means all the materials are non-GMO, 0.5% think it means the main materials are non-GMO, 19.8% think it means the materials of this product do not have genetically modified organisms, and 26.0% don't know. The right answer is e. From these, people cannot read labels.

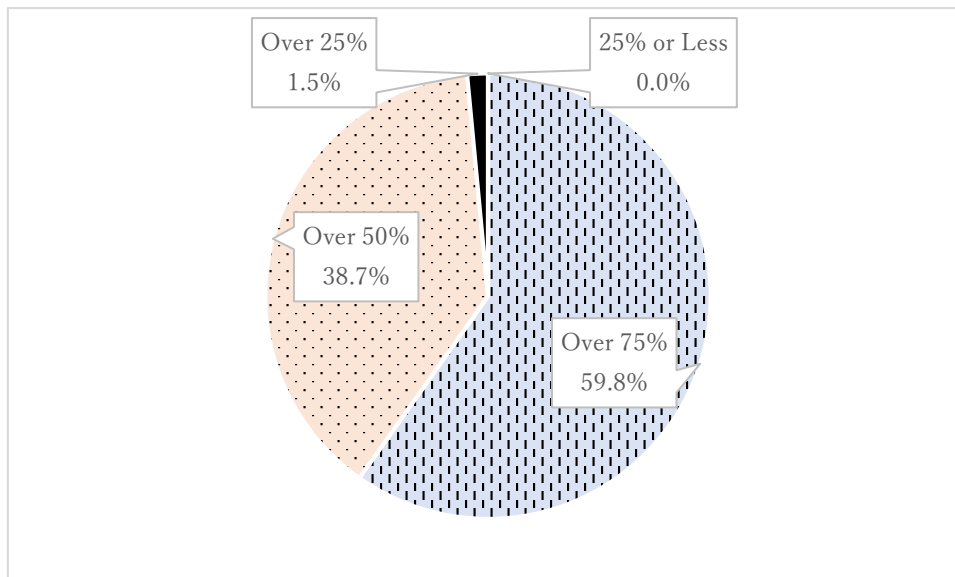
For the cognitive component of the labeling regulations of GM food, according to question 18, less than one-fourth of consumers chose the correct answer, while others opted for other misleading incorrect answers. This indicates that consumers have only a vague concept of food labeling regulations, lacking specific knowledge.

Q19: How far do you trust the Non-GMO label?

Table 31

Trust Level	Number of Interviewees	Percentage
Over 75%	235	59.8
Over 50%	152	38.7
Over 25%	6	1.5
25% or Less	0	0.0
Total	393	100.0

Chart 13



59.8% of respondents trust over 75% of non-GMO labels, 38.7% trust over 50%, 1.5% trust over 25%, and no one trusts 25% or less. From these, people think non-GMO labels are more trustworthy than not.

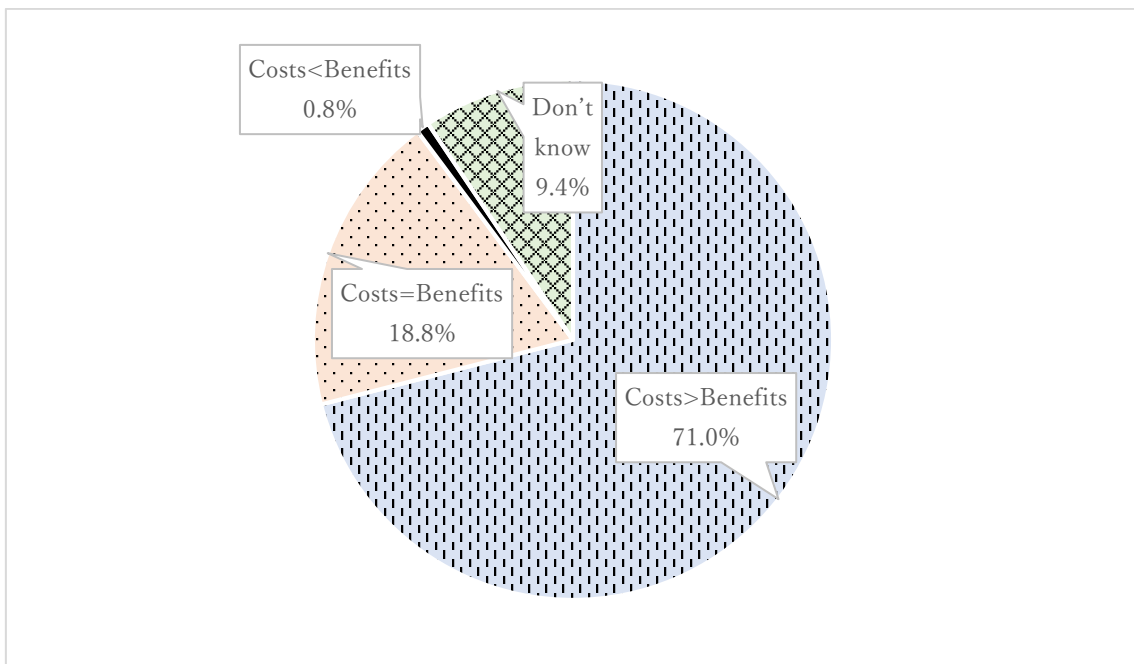
For the affective component of the labeling regulations of GM food, according to question 19, consumers have a high level of trust in non-GMO labels on food products.

Q20: Which do you think is greater, the costs or the benefits of GM foods?

Table 32

Costs & Benefits	Number of Interviewees	Percentage
Costs>Benefits	279	71.0
Costs=Benefits	74	18.8
Costs<Benefits	3	0.8
Don't know	37	9.4
Total	393	100.0

Chart 14



71.0% of respondents think that the costs of GM food are more than its benefits, 18.8% think that its costs are the same as its benefits, 0.8% think that its benefits are more than its costs, and 9.4% don't know. From these, most people think that the costs of GM food are

greater than its benefits.

For the affective component of the labeling regulations of GM food, according to question 20, most consumers believe that the costs of GM food outweigh the benefits. Although a small percentage of consumers think the costs and benefits are fairly balanced, overall, consumers maintain a pessimistic outlook on the future of GMO foods.

Conclusions & Limitations

Conclusions

From the dimension of habitual residence, people from the southern parts feel more confident about their knowledge of genetically modified foods and labeling regulations than people from the northern parts and Inner Mongolia and Xinjiang, the number is limited compared to people from the northern parts. Although the largest number of people from the southern parts are less receptive to genetically modified foods, they believe that they have the largest proportion of genetically modified foods in their daily diets. People in Inner Mongolia and Xinjiang, because they are very different in terms of religion and ethnicity from other regions, their lifestyles are far away from genetically modified food, so they don't care much about genetically modified food and related regulations.

From the dimension of gender, females are more concerned about GM food in their daily lives, but males feel more confident about their knowledge of GM food and regulations.

From the dimension of age, young people and middle-aged people tend to learn about GM food because of the courses in the school. The elderly people know about GM food mainly from social media and TV programs so most of them lack specialized knowledge. Although young people are more confident about their knowledge of GM food, most of them are careless about GM food and related regulations. The elderly people are more concerned about GM food in their daily lives, but it may be hard for them to understand the terminology of GM food and related regulations. What they can do best is to see the label when they are buying.

From the dimension of education levels, people who got up to primary education and secondary education only, do not feel confident about their knowledge because they didn't have related courses in school. People who have attained tertiary education are more confident about their knowledge of GM food, but some of them aren't concerned about GM.

From the dimension of income levels, most people who are at a low-income level are not confident about their knowledge of GM food, but they aren't concerned too much about GM food and related regulations. People who are at a high-income level are more confident about their knowledge of GM food and related regulations, but some of them aren't concerned too much about GM food in their daily lives. People who are at middle-income level, are most concerned about GM food in their daily lives.

From the dimension of having children to look after or not, people who have children to look after, are concerned more about GM food in their daily lives and also concerned about the related regulations than people who don't have children to look after but only to a limited extent.

From others, people still believe in the relevant laws and regulations of genetically modified foods, but people need more knowledge of the laws and regulations of GM food.

The data from consumers who live in Inner Mongolia and Xinjiang is really different from the data from the north and the south. Inner Mongolia and Xinjiang, with vast land areas and relatively low population density, have abundant land resources compared to other plains and hilly regions. The extensive grasslands contribute to a diet that is predominantly focused on meat and dairy due to cultural, ethnic, and religious reasons. Vegetables are consumed in

moderation, and there is a high demand for quality meat. These dietary habits result in a self-sufficient food culture. Their traditional agricultural practices, influenced by cultural factors, have kept them away from adopting genetically modified crops, feed, and foods. With the advancement of technology and increased access to education, the younger and middle-aged populations are becoming more knowledgeable about genetically modified foods. However, due to the reasons mentioned earlier, their concerns about genetically modified foods have not significantly increased. People in the southern and northern regions are exposed to modern agriculture and animal husbandry. They have easier access to various forms of knowledge. Consequently, genetically modified foods may draw more attention from them, evoking concerns, curiosity, or a mix of emotions. This shift in thinking could be attributed to the impact of technological advancements on people's perspectives.

Limitations

The number of respondents, 393, is very limited. I visited only four provinces to conduct this survey during the summer vacation. I selected Beijing and Xian, expecting that many travelers from other provinces across China would be around there, so that I prioritized the diversity in the respondents in terms of their native provinces over the number of local people.

The attitudes of respondents are limited. It is better to do some interviews because different respondents understand each question differently. There was no practical way to ensure that they fully understood the questions before answering.

The distinctions between ethnic minorities are also limited. There are 56 ethnic groups in China, and only a simple distinction is made here about the people in Inner Mongolia and to a very limited extent, some individuals from Xinjiang.

References

Mendel, Gregor. 1866. Versuche über Pflanzenhybriden. *Verhandlungen des naturforschenden Vereines in Brünn, Bd. IV für das Jahr 1865*, Abhandlungen, 3–47.

Белозерский А. Н., Чигирев С. Д. Биохимия, 1, 136-146, 1936.

Wieczorek, A. M. & Wright, M. G. (2012) History of Agricultural Biotechnology: How Crop Development has Evolved. *Nature Education Knowledge* 3(10):9

Stewart Shuman. DNA Ligases: Progress and Prospects. *Journal of Biological Chemistry*. VOLUME 284, ISSUE 26, P17365-17369, JUNE 2009

Meselson M., Yuan R. DNA restriction enzyme from E. coli. *Nature*, 217 (134):1110-4. 1968

Jackson DA, Symons RH, Berg P (October 1972). "Biochemical method for inserting new genetic information into DNA of Simian Virus 40: circular SV40 DNA molecules containing lambda phage genes and the galactose operon of Escherichia coli". *Proceedings of the National Academy of Sciences of the United States of America*. 69 (10): 2904-9.

Gutsch S, Hermann W, Stenzl W, Tscheliessnigg KH (1 May 1973). "[Displacement of electrodes in pacemaker patients (author's transl)]". *Zentralblatt für Chirurgie*. 104 (2): 100-4.

Martineau, B., "First Fruit", McGraw Hill Book Co., p191.

Ministry of Science and Technology of China. 1993. Genetic Engineering Safety Management Measures.

https://www.most.gov.cn/xxgk/xinxifenlei/zc/gz/202112/t20211210_178512.html

Zhang Rui, Wang Yuan, Meng Zhigang, Sun Guoqing, Guo Sandui. Review and prospect of

domestic transgenic insect-resistant cotton. *China Agricultural Science and Technology Review*. 2007(04):32-42.

Wang Xinling. 2010. The history of genetically modified organisms. *Party and government forum*. 2010 (20): 48-49.

Ministry of Agriculture and Rural Affairs of the People's Republic of China. 2010. 2010

Central Document No. 1.

http://www.moa.gov.cn/xw/zwdt/201002/t20100201_1425496.htm

Ministry of Agriculture and Rural Affairs of the People's Republic of China. 2020. 2020 List of Approved Safety Certificates for Agricultural Genetically Modified Organisms.

<http://www.moa.gov.cn/so/s?qt=2020+%E5%AE%89%E5%85%A8%E8%AF%81%E4%B9%A6>

Ministry of Agriculture and Rural Affairs of the People's Republic of China. 2021. 2021 List of Approved Safety Certificates for Agricultural Genetically Modified Organisms.

http://www.moa.gov.cn/ztl/zjyqwgz/spxx/202112/t20211227_6385638.htm

Ministry of Commerce of the People's Republic of China. 2019. Regulations and Labeling Requirements for Genetically Modified Foods - Domestic Perspective.

<http://chinawto.mofcom.gov.cn/article/jsbl/zszc/201911/20191102910247.shtml#:~:text=%E4%BE%9D%E6%8D%AE%E3%80%8A%E5%9F%BA%E5%9B%A0%E6%94%B9%E9%80%A0%E9%A3%9F%E7%89%A9%E8%87%AA%E6%84%BF%E6%A0%87%E7%AD%BE%E6%8C%87%E5%BC%95%E3%80%8B%EF%BC%8C%E9%A3%9F%E7%89%A9%E4%B8%AD%E5%90%AB%E6%9C%89%E5%A4%A7%E4%BA%8E%25%E7%>

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B8%E5%90%8C%E3%80%82

Yin Liu (2016). GMO cognition “misalignment” interpretation of the “Survey of Public Attitudes to GM Technology”. *People. cn.*
<http://scitech.people.com.cn/n1/2016/0517/c1007-28355424.html>

Minsi Xu, Xiao Cui (2022). A survey on society’s perceptions and attitudes towards GM foods. *Wenmibang.* <https://www.wenmi.com/article/putn8009zpm.html>

Deng Yuqiong (2017). Survey and analysis of consumer acceptance of GM foods. <https://www.wenmi.com/article/pxbmdr04b54t.html> <https://www.docin.com/p->

1949600392.html

Shiqu Weishipin. 2022. In the 2003 Sino-US soybean war, the four major grain merchants partnered to short China, but they were "defeated" in grain storage. *Wangyi*. <https://www.163.com/dy/article/HFKVEC8D0543IBK3.html>

Chen Simin, Zhang Yinhong. 2014. The Review of Golden Rice Alleviating Vitamin A Deficiency. *Food Research and Development*. 2014(7):133-136.

Huang, J. Awareness, acceptance and willingness to buy genetically modified food in urban China. *China Soft Sci*. 2, 61–67 (2006).

Liu, Z., Wang, C., Li, N., Zhang, J. & Zhang, K. Investigation and analysis for Jinan consumers' recognition to genetically modified food. *Rev. China Agric. Sci. Technol*. 1, 52–58 (2007).

Zhou, M. & Liu, Q. Investigation for Changsha consumers' recognition and attitude to genetically modified food. *Consum. Econ*. 3, 51–53 (2009).

Fan, L., Wei, W. & Zhu, Z. Investigation and thinking for consumers' recognition to GM Food. *Chin. Agric. Sci. Bull*. 20, 80–85 (2010).

Shen, J., Yan, M., Tian, Z. & Zhu, X. The survey on consumer perception about GM food in Nanjing City. *J. Anhui Agric. Sci*. 39, 10909–10912 (2011).

Li, P. Consumer awareness and acceptance of GM foods in Guangzhou City. *Mark. Mod*. 19, 70–72 (2010).

Mao, X., Wang, P. & Zhang, M. Public Attitudes towards Social Evaluation of Genetically Modified Food in China: Survey and Analysis ——Based on Data Analysis of Questionnaire

in Hubei Province. *Journal of Huazhong Agricultural University (Social Sciences Edition)*. 95, 5–11(2011).

Feng, L., Qi, Z., Tian, Y. & Zhou, H. Analysis on the impact factors of consumers' purchase intention of GM food. *J. China Agric. Univ.* 3, 7–14 (2012).

Wu, W. Consumer awareness of genetically modified foods and consumer attitude survey analysis of the situation. *J. Southwest Univ. Natl* 5, 771–775 (2011).

Xue, X. Investigation for Hangzhou urban population's recognition and attitude to GM Food. *Mod. Prop. Mgmt.* 1, 84–85 (2012).

Ruan, J., Chen, L., Guo, S. & La, W. Investigation and analysis of consumer recognition of genetically modified foods and transgenic labeling—a case study of Shenzhen city. *Mod. Food Sci. Technol.* 4, 848–852 (2013).

Zheng, K., Wende, Chen & Jiayin., Xu Investigation and analysis for Chengdu consumers' recognition to genetically modified food. *J. Anhui Agric. Sci.* 33, 12966–12968 (2013).

Zhang, Y., Zheng, Z. & Gao, Y. Consumer perception and acceptance of GMfood. *China Rural Surv.* 6, 49–61 (2015).

Li, Q., Wang, Q., Liu, Y., Ma, L. & Ma, M. Analysis of the perception and purchase of GM food in Anhui Province. *Chin. Agric. Sci. Bull.* 35, 116–121 (2015).

Zhang, X., Liu, X. & Deng, M. GMfood: a study of Chinese public's recognition and attitude. *J. Anhui Agric. Sci.* 20, 6783–6786 (2014).

Guo, L. An investigation on cognition attitudes of the consumers towards GM foods in Zhuzhou. *Mod. Food* 21, 12–15 (2015).

Meng, L., Yang, L. & Cheng, J. Survey of consumer recognition of GM food in Shanxi province.

Food Saf. Guide 24, 55–57 (2016).

Cui, K., Shoemaker, S.P. Public perception of genetically-modified (GM) food: A Nationwide

Chinese Consumer Study. npj Sci Food 2, 10 (2018). [https://doi.org/10.1038/s41538-018-](https://doi.org/10.1038/s41538-018-0018-4)

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