Research on Consumers' Cognition and Demand for Food Label Information

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Abstract: Food labels are the key tool for consumers to understand the basic information and characteristics of food when purchasing food. The purpose of this research is to investigate the cognition and demand of ordinary consumers on food label information in China, so as to provide relevant data for food safety supervision and management departments and food producers and operators, and to provide reference for regulatory authorities to formulate policies, for food enterprises to make food labels and for science popularization purpose. The research found that 59.69% of consumers often check labels when buying food, and the production date, shelf life and food name on the food label are the most focused information, as 93.85% and 89.54% of consumers will check respectively the production date and shelf life when examining the label. At the same time, 59.38% of consumers want the production date and shelf life to be marked in a prominent position on the food outer package; 88.31% want the production date to be marked in the order of year-month-day; 80.31% want the production date of food with a short shelf life not exceeding 72 hours to be marked to a specific hour; and 89.85% want the food shelf life to be marked to a specific date. Most consumers have encountered the problems that the labeled text is too small, or the contrast between the labeled text color and the background color is not obvious, so the labeled text cannot be clearly seen, and that the labeled text position is not eye-catching and cannot be found on the food packaging. Therefore, it is suggested to strengthen the strict management of food labels to ensure that the production date, shelf life, food name, etc. are conspicuously marked on the conspicuous positions of food labels in a standardized way.

1. INTRODUCTION
Food labeling is the carrier for food producers and operators to transmit food information to consumers, and it is also the most direct and effective way for consumers to understand food components and characteristics. Food labels include words, graphics, symbols and all descriptions on food packaging. The impact of food labels on consumers mainly includes two aspects: first, the labels' contents. Consumers know the food's characteristics, producer, production date, shelf life, net content, etc. through the words, graphics and other instructions on the label, the ingredients of food through the ingredient list, and the nutrition information of food through the nutrition label. And the second is the labeling method of font size, color, position and clarity of the labeled content [1]. Food labels are the main basis and guide for consumers to buy food.

The "Food Safety Law of the People's Republic of China" stipulates that prepackaged food's packaging should have labels, and provides the items that should be marked on the labels. The GB 7718-2011 "National Food Safety Standards: General Rules for the Labeling of Prepackaged Food" stipulates the general requirements for labeling contents and labeling methods of prepackaged food.
such as food name, ingredient list, net content and specifications, names, addresses and contact information of the producer and distributor, date labeling, storage conditions, food production license number, product standard code, etc.\textsuperscript{[2]} The State Administration for Market Regulation is drafting the "Measures for the Supervision and Administration of Food Labeling", which mainly stipulates the basic requirements, general regulations, specific labeling requirements, obligations of producers and operators as the subjects carrying out food labeling, and the responsibilities of regulatory departments to strengthen the supervision of food labeling.

At present, there are also some phenomena of nonstandard food labeling in our country, for example, the name of the food is not standardized and does not reflect the true attribute of the food; the labeling of production date and shelf life is not clear and the labeling position is not obvious; the ingredient list, factory name and origin are not standardized; storage conditions are not clearly stated; specifications and net content are not labeled as required; the product standard implemented, product grade and nutrition labeling are problematic; the implication of the common food to have health care and therapeutic effects, etc.\textsuperscript{[3-5]}, misleading consumers' consumption behaviors.

The purpose of this research is to look into the cognition and demand of Chinese consumers on food labeling information by questionnaire survey and data analysis, so as to provide relevant data for food safety supervision and management departments and food producers and operators, and to provide reference for regulatory authorities to formulate policies, for food enterprises to make food labels and for popular science popularization.

2. BASIC INFORMATION OF THE RESEARCH

In this research, a self-designed questionnaire on consumers' cognition and demand for food labeling information was used. The contents of the questionnaire include the basic information (including gender, age and educational background) of the investigated consumers, the habits of checking food labels when buying food, the main information they pay attention to when checking food labels, the expected food production date and shelf life labeling forms, and the common food labeling problems encountered. The form of electronic questionnaire was adopted. From December 2019 to January 2020, contact information was randomly selected from the city sample database, and the online survey was conducted by sending questionnaire link and two-dimensional code to the survey subjects.

A total of 325 valid questionnaires were received in the survey, covering 28 provinces in China. Among these subjects, 57.85% are men and 42.15% are women, mainly 30-50 years old. Specifically, 39.38% are 30-40 years old, 32.62% are 40-50 years old, 12.62% are 20-30 years old, 9.85% are 50-60 years old, 3.08% are over 60 years old, and 2.46% are under 20 years old. 41.23% haven't received undergraduate education, 38.77% have a bachelor's degree, and 20.00% have a master's degree. The basic statistical information of the survey samples is shown in Table 1.

| Sample characteristic | Category               | Quantity | Proportion (%) |
|-----------------------|------------------------|----------|----------------|
| Gender                | Male                   | 188      | 57.85          |
|                       | Female                 | 137      | 42.15          |
| Age                   | Under 20 yrs           | 8        | 2.46           |
|                       | 20-30 yrs              | 41       | 12.62          |
|                       | 30-40 yrs              | 128      | 39.38          |
|                       | 40-50 yrs              | 106      | 32.62          |
|                       | 50-60 yrs              | 32       | 9.85           |
|                       | Above 60 yrs           | 10       | 3.08           |
| Education             | Below bachelor's degree| 134      | 41.23          |
|                       | Bachelor's degree      | 126      | 38.77          |
|                       | Master's degree        | 65       | 20.00          |
| Total sample size     |                        | 325      |                |
3. RESULTS AND ANALYSIS

3.1 Subjects’ habits of checking food labels when buying food
Of the 325 consumers investigated in the survey, 59.69% say they often check food labels when buying food; 34.15% occasionally check food labels; and 6.15% generally do not check food labels. The research results show that most consumers have the habit of checking food labels and pay attention to food labels when buying food. Food labels are the main basis for consumers to buy food.

3.2 Main information subjects pay attention to when checking food labels
For the information on food labels, consumers pay most attention to the production date and shelf life. In the survey, 93.85% of consumers say that they will pay attention to the production date when checking food labels, and 89.54% will check the shelf life. Secondly, 59.38% will check the food name; 49.85% will check the ingredient list; 40.62% will check the nutrition list; 40.31% will check the storage conditions; 37.85% will check caution signs or cautions; 35.08% will check the net content; 30.15% will check the origin; 26.77% will check the name, address and contact information of the producer; and 23.38% will check the specification, as shown in Table 2.

Table 2 Statistics of main information consumers pay attention to when viewing labels

| Information                        | Quantity | Proportion (%) |
|------------------------------------|----------|----------------|
| Production date                    | 305      | 93.85          |
| Shelf life                         | 291      | 89.54          |
| Food name                          | 193      | 59.38          |
| Ingredients list                   | 162      | 49.85          |
| Nutrition list                     | 132      | 40.62          |
| Storage conditions                 | 131      | 40.31          |
| Caution signs and cautions         | 123      | 37.85          |
| Net content                        | 114      | 35.08          |
| Origin                             | 98       | 30.15          |
| Producer name, address and contact information | 87 | 26.77          |
| Specification                      | 76       | 23.38          |
| Other information                  | 13       | 4.00           |
| Total sample size                  | 325      |                |

Therefore, food label information with high importance to consumers includes production date, shelf life, food name, etc. The "Food Safety Law of the People's Republic of China" stipulates that the production date, shelf life and other matters of food labels shall be clearly marked and easily identified. The GB 7718-2011 "National Food Safety Standards: General Rules for the Labeling of Prepackaged Food" stipulates that specific names reflecting the real attributes of food should be clearly marked in conspicuous positions on food labels. The production date, shelf life, food name and other information to which consumers pay more attention should be marked in a prominent position on the food label, using a larger font or special color, convenient for consumers to view.

3.3 Expected food production date and shelf life marking forms of subjects
Production date and shelf life are important information on food labels. However, some commercial food labels have the problems of unclear date labeling and unclear labeling position. Some food producers deliberately mark the production date and shelf life in inconspicuous positions, making it difficult for consumers to find such information. Some food labels say "See XX for the date of production", but the information cannot be found. Some production dates and shelf life are illegible and difficult for consumers to recognize[6]. And in some cases, date information overlapping with other marked contents causes identification difficulty.
Regarding the food production date and shelf life marked on the outer package, 59.38% of consumers think that such information should be marked on the most obvious position on the outer package without the need to specially look for; 18.15% think such information should be marked at the seal of the outer package; 12.00% think such information can adopt the form of "See XX part of the package" and be marked at the corresponding part; and only 2.15% think that such information can be marked casually. Most consumers want the production date and shelf life to be marked prominently on the food label.

Regarding the labeling form of food production date, taking a product produced on December 1, 2019 as an example, 88.31% of consumers think that the food production date should be labeled in the form of "20191201" or "2019/12/01"; 7.38% think that it should be labeled in the order of day-month-year; and 4.31% think that it should be labeled in the order of month-day-year. More than 88% of consumers hope that the date should be marked in the order of year-month-day, which fits the Chinese habit of reading date.

Regarding the labeling form of the production date of short shelf life food with shelf life not exceeding 72 hours, 80.31% of consumers think that it should be labeled to a specific hour, while 19.69% think that it is sufficient to label a date.

Regarding the labeling form of food shelf life, taking a product produced on December 1, 2019 with a shelf life until November 30, 2020 as an example, 68.31% of consumers think that the information should be marked in the form of "Best before November 30, 2020" or "Exp. Date November 30, 2020"; 21.54% think that it should be marked in the form of "20201130" or "2020/11/30"; and 10.15% think that it should be marked as "Shelf life is 12 months (or 365 days, or 1 year)". Nearly 90% of consumers want the shelf life of food to be marked with a specific date, not just duration of a few months or years.

3.4 Investigation on food labels reflecting the true attributes of food
At present, some food labels reflect wrong food attributes and are easy to mislead consumers. The questionnaire includes a question: if a fruit juice product is not added with apple pulp but is seasoned with apple-flavored essence, is it appropriate to print a large apple picture the packaging? 87.38% of consumers disapprove this practice, believing that the picture may mislead consumers, and 12.62% can accept this. There are also some beverage manufacturers who label orange-flavored beverages blended with edible essence and edible pigment as "orange drink". This kind of labeling is wrong. A real orange drink should be made from fresh orange, while a drink blended with essence and pigment can only be labeled as "orange-flavored drink". This indicates the problem of nonstandard food name[7].

3.5 Common food labelling problems encountered by subjects
According to their past food buying experience, 54.46% of consumers reflect there are cases where the text marked on the label is too small to be clearly seen; 42.77% say that they cannot clearly identify the marked text because the contrast between the marked text color and the background color is not obvious; 41.54% say that they cannot find the marked text because the marked text position is not eye-catching; and 32.62% say that they cannot see what the marked text is because the font is too special.

3.6 Investigation on correcting food labeling errors
As for the wrong information on food packaging due to printing problems, 74.15% of consumers think that the wrong information cannot be altered; 14.46% think that it depends on the situation and the wrong information that does not affect food safety (such as typos) can be altered; 8.62% think that such information can be altered by adding a label; and 2.77% think that such information can be altered.
If the production date or shelf life on the food package is incorrect due to printing problems, 94.77% of consumers think that the wrong information cannot be altered, and 5.23% of consumers think that such information can be altered.

4. Conclusions
This research helps us to understand consumers' cognition and demand for food labeling information. Most consumers value food labels when buying food, and particularly pay attention to production date, shelf life and food name. However, there are problems such as the labeled text is too small, or the contrast between the labeled text color and the background color is not obvious, so the labeled text cannot be clearly seen, and the labeled text position is not eye-catching and the text cannot be found easily on the food packaging. These basic data can be used as a reference for regulatory authorities to formulate policies, food enterprises to make food labels and for science popularization purpose.

The regulatory authorities should further improve relevant laws and standards on food labeling, enterprises should strengthen self-restraint, and at the same time strengthen food labeling education for consumers. It is suggested that the specific requirements for the location, font size, color, font and clarity of important labeling contents such as production date, shelf life and food name on food labels should be continuously refined and perfected, and strict management should be implemented. Such information should be conspicuously marked on the conspicuous position of food labels, and the labeling should be more standardized.

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