

Construction and application Research of Food safety Standard System Evaluation Model based on Big Data

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Abstract. In the steady development of social economy, our comprehensive strength has been improved, which not only promoted our social economic development and production and living standards, but also accelerated the pace of food processing industry innovation. After entering the era of big data, in order to provide safe and convenient food for consumer groups, Chinese researchers have gradually optimized various food safety detection technologies and risk assessment while strengthening the research on food safety and quality control, and regard it as an important task for social construction and development. In this paper, on the basis of understanding the current situation of food safety standard system evaluation in the era of big data, according to the main content of the existing food safety standard system evaluation model, combined with the specific effects of model construction and application in practice, in order to provide an effective basis for food safety management in the era of big data.

Keywords: Big data; Food safety; Evaluation model; Evaluation model; Safety index.

1. Introduction

In recent years, according to the development of the food industry of our country, the quality safety management work has the following meanings: on the one hand, food safety is the stable development of social economy basic condition, only to build a perfect food quality safety management system, can from the basis to ensure food quality, obtain more social residents' recognition and support. For example, the dairy pollution incident that broke out in China in 2008 not only involved a large number of milk powder manufacturers, but also reduced the trust index of the dairy industry in the people's heart. It also directly affected China's economic development level and social environmental stability. On the other hand, food quality and safety can guide the high quality development of the production work of food enterprises, and has a close relationship with technology upgrading, standardized sales, material selection, etc., which can guarantee the quality and efficiency of the whole food industry from the basis. As an important basis for the definition of food hazards, big data technology can be used to accurately judge and clearly regulate the content and content of hazardous substances in various foods by using a large number of experimental data and clinical cases. The application of this theoretical technology to the food safety standard system can not only quickly study the nutritional needs and hazards of various groups, It can also collect relevant data information for the convenience of subsequent research and application.[1-3]

Nowadays, Chinese scholars will make full use of big data thinking when studying food safety standard system and evaluation model. The specific work is reflected in the following points: On the one hand, when establishing a perfect and standardized food safety standard system, it will ensure the orderly implementation of relevant contents, record the whole process of food production in detail, track and analyze the application effect of standardized production and processing technology, ensure the effective analysis of the production site staff, and finally verify the standardization and rationality of standardized production and processing technology. On the other hand, when constructing the evaluation model based on big data technology, the staff and production process of the department will be strictly controlled. This work is mainly carried out before food acceptance, with the purpose of fundamentally reducing the occurrence of safety

accidents. For example, we should comprehensively standardize the operation requirements of professional and technical personnel, carefully inspect the production process of food safety, and pay attention to the safety and quality of applied materials and technologies, so as to improve the comprehensive production capacity of food enterprises.[4]

In this paper, on the basis of understanding the application and construction status of food safety standard system in the era of big data, according to the existing food safety management standard system and evaluation model, focusing on the application effect of evaluation model, and its positive impact on the safety management of food enterprises in the new era, in order to lay the foundation for the optimization of food safety quality.[5]

2. Methods

2.1 Security Architecture

Combined with the basic theory of three-dimensional space, a food safety technical framework with big data as the core is constructed. The specific structure is shown in Figure 1 below:[6]

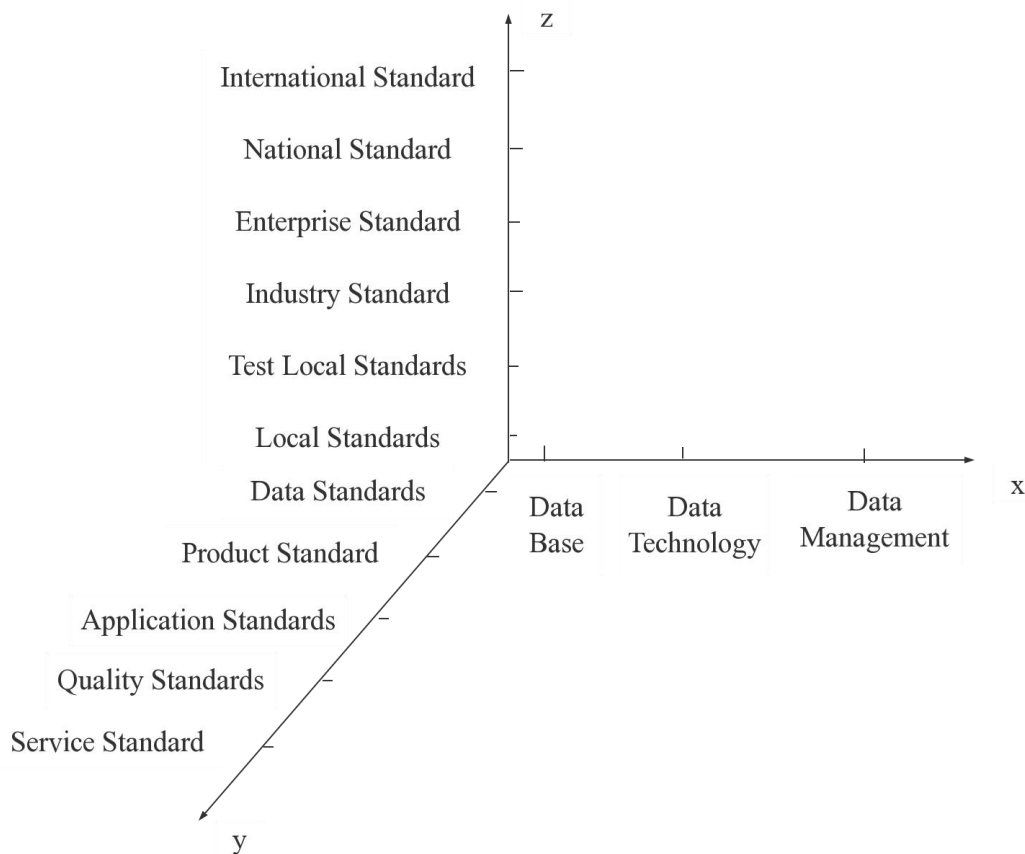


Figure 1. Architecture of food safety technology based on big data

Based on the analysis in the figure above, we can see that the three axes respectively represent the three attributes of food safety, in which the x axis refers to the overall data flow in the field of food safety, such as data generation, data transmission, data collection, data storage, etc. The Y-axis represents the user body, such as food production enterprises, administrative directors, network media, consumer groups, etc. The Z-axis refers to business related fields, such as manufacturing enterprises, management systems, safety supervision systems, data information risk analysis, etc.[7-9]

As food safety contains relatively complex contents, it is a typical interdisciplinary subject. Therefore, in the era of big data, innovation and development should focus on food sources, production, logistics, transportation, sales promotion and other links. Combined with the analysis of

the food safety big data standard system shown in Figure 2 below, it can be seen that it contains government supervision, enterprise production, safety and quality monitoring and other information, and it should follow the basic data standards, product quality standards, technical standards, application standards, etc., for the purpose of faster research and judgment of the safety and quality of food enterprises.

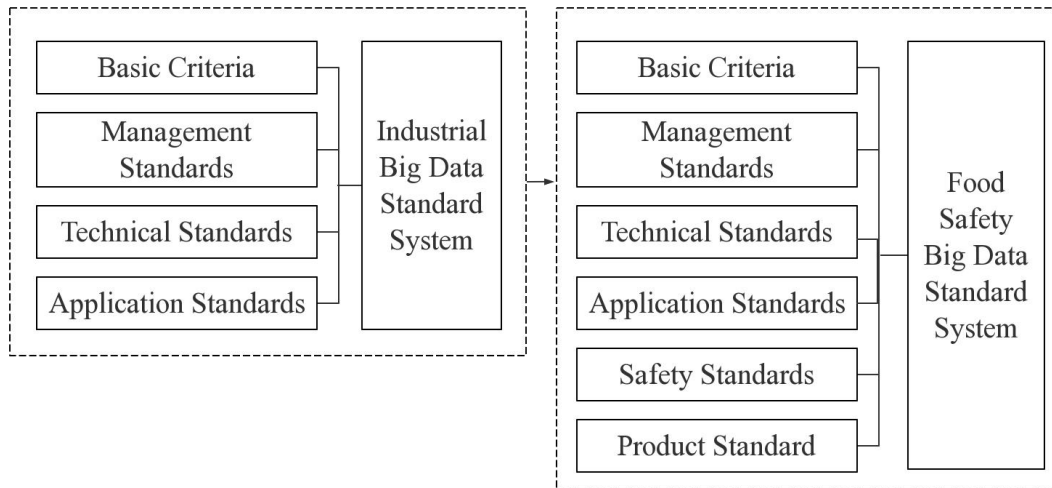


Figure 2. Structure diagram of food safety big data standard system

2.2 Evaluation model

In the big data environment, the establishment of food safety standard system evaluation model for food enterprises is of great significance to food supervision. It should be noted that the target of service should be defined before research and innovation, including government departments, food enterprises, evaluation agencies, consumer groups, media platforms, etc. From the perspective of practical application, the evaluation framework of food safety index is divided into three parts: first, it refers to the prior supervision, the enterprise should start from the food safety routine inspection and safety risk control; The second is the handling in the matter, the common handling methods are divided into two kinds, one refers to recall supervision, the other refers to accident control supervision; Finally, it refers to after-action accountability. Department employees should systematically summarize the main causes of accidents, and then conduct follow-up investigation on the conclusions of accidents, so as to provide effective basis for the safety management of food enterprises. The evaluation model is shown in Figure 3 below:[10]

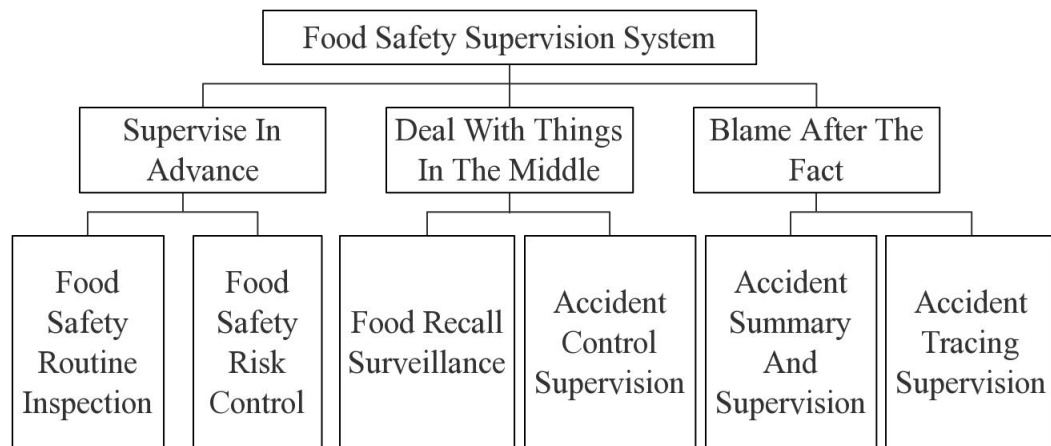


Figure. 3 Structure diagram of food safety standard system evaluation model

In view of the three links of the above design, six secondary indexes can be proposed in the evaluation of food safety issues, the specific contents are shown in Table 1 below:[11-12]

Table 1 Analysis of evaluation indexes of food safety

Primary index	Secondary index	Three-level index
Prior supervision indicators B_1	Conventional regulatory indicators C_1	Indicators of public service publicity C_{11}
		Compulsory insurance index C_{12}
		National standard index C_{13}
	Food risk regulation C_2	Monitoring system establishment indicators C_{21}
		Evaluation system establishment indicators C_{22}
		Communication system establishment indicators C_{23}
		Full coverage of random inspection indicators C_{24}
In-process indicators Accident tracing supervision index B_2	Food recall supervision C_3	Index of recall system establishment C_{31}
		Timeliness index C_{32}
		Information availability indicators C_{33}
		Information simplicity indicator C_{34}
		Information recording indicator C_{35}
	Accident control supervision index C_4	Recall tracking metrics C_{36}
		Command establishment indicators C_{41}
		Professional indicators of personnel C_{42}
		Job timeliness indicator C_{43}
		Warning information announcement indicators C_{44}
Post-mortem metrics B_3	Accident summary supervision index C_5	Information accuracy index C_{45}
		Accident investigation indicators C_{51}
		Accident handling indicators C_{52}
		File record index C_{53}
		Check feedback indicators C_{54}
		Responsibility interview indicators C_{55}
	Accident tracing supervision index C_6	Traceability survey index C_{56}
		System optimization index C_{61}
		Responsibility survey index C_{62}
		Personnel responsibility indicators C_{63}
		Indicators of impartiality C_{64}
		Comprehensive indicators C_{65}

Based on the analysis of the above table, it is found that the conventional regulatory indicators are mainly used to evaluate the regulatory work of food enterprises. Food risk supervision mainly studies the potential safety risks; Food recall supervision index is used to control the occurrence probability and risk factors of food safety accidents. The accident control supervision index guarantees the life and property safety of consumer groups; Accident summary supervision index is

used to learn more work experience and improve practical work efficiency; Accident tracing supervision index is used to deal with the responsible party and guarantee the injured party to obtain basic authority.[13-14]

3. Result analysis

According to the evaluation model of food safety standard system proposed in the above research, its application effect in the safety management of food enterprises is analyzed, the evaluation conclusions of various indicators are objectively evaluated, and the advanced, systematic and scientific standard system is established by means of expert investigation, data statistics and questionnaire survey. Finally, it can provide effective basis for safety management and structure optimization of food enterprises. Combined with the analysis of the evaluation content shown in Figure 4 below, it can be seen that in the era of big data, the safety evaluation of food enterprises mainly includes system construction, service quality, technical indicators, economic benefits, implementation effects, improvement results, social benefits and many other contents. Although the experience gained in the standard system of food safety big data is less at the present stage, with the continuous development of social economy and science and technology, combined with the characteristics of industrial development to establish a reference model, the overall design of the quality of the evaluation system can better optimize the quality of food industry products.[15]

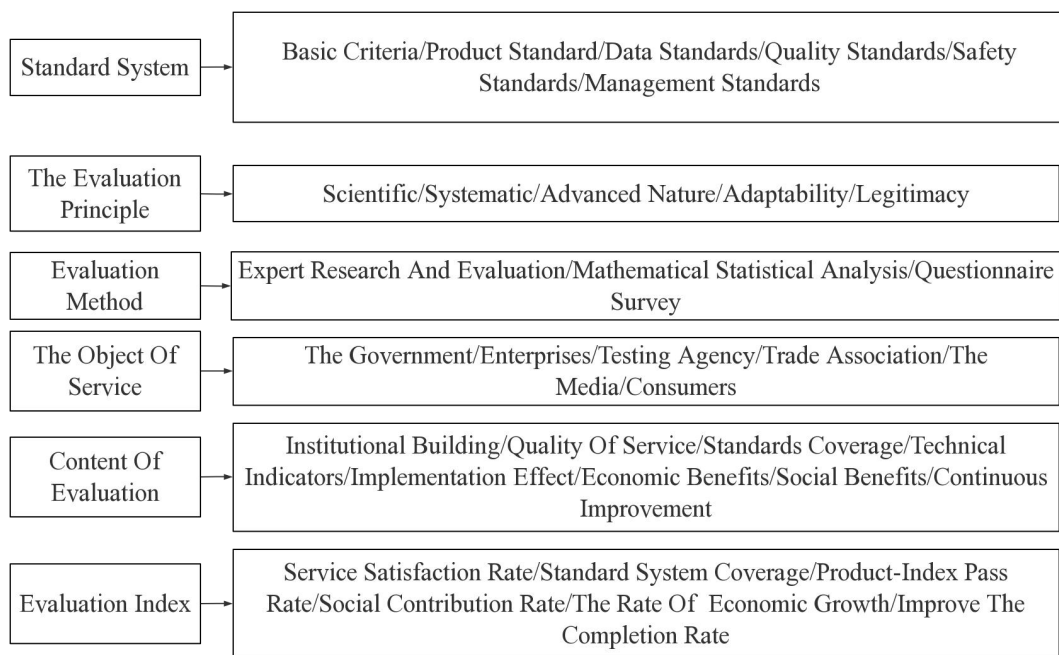


Figure 4 Food safety evaluation content based on big data

Therefore, in view of the development of big data technology and the application effect of safety standard system evaluation model, the food industry puts forward the following development suggestions: First, the industry policy system should be gradually optimized. It is necessary to strengthen the top-level design of standardization, no matter in terms of fund investment or talent training. Therefore, local government departments should put forward effective management methods for talent training, fund use, development reward and achievement transformation on the basis of fully implementing the spirit of the document and industry requirements. We will encourage and support enterprises, scientific research institutions and social organizations to take an active part in the standardization of big data and share the accumulated experience in system construction. In this process, participants should formulate long-term development goals and short-term development goals of food safety big data standardization according to their own development characteristics, and gradually improve the standardized preferential policy system, so

as to lay the foundation for the creation of high-quality food industry. Secondly, we should pay attention to the research and promotion of standard system. When building and promoting the evaluation model of food safety standard system based on big data technology, it is necessary to accurately judge whether the content and application of this system are scientific and whether the expected development goals can be truly achieved in the food industry. Only in this way can the food safety management level be continuously optimized on the basis of improving the content of the standard system; Thirdly, promote food safety construction based on Big data standardization professional technical committee. According to the cumulative experience of the food industry, the professional technical committee for big data standardization is mainly responsible for developing and improving the standard system in the field of big data, and will organize the research work of related technical standards, to help the food industry more quickly develop a perfect management mechanism, and actively undertake the standardization of food safety at home and abroad in the safety management of food enterprise, Give full play to the application value of big data technology theory, and promote the construction and application of food safety big data standardization; Finally, we should carry out the research of evaluation index of standard system actively. Select representative food safety big data enterprises, fully implement the pilot demonstration work of the standard system, clarify the technical requirements of the standard system evaluation model, and gradually improve the main content of the existing standard system evaluation model. Not only can food enterprises obtain more data information, facilitate data collection and processing, but also on the basis of in-depth mining of data value, Through statistical calculation to determine the evaluation index. Strengthen the food safety big data standard system evaluation research, to promote our food safety big data standardization construction management lays a foundation to guarantee, therefore, the food industry should attach importance to the food safety standard system evaluation model with big data technology as the core, gradually enhance the safety service ability of food enterprises, pay attention to the training of technical personnel. In order to create a quality food safety management system in the increasingly competitive market environment.

Conclusion

In conclusion, the food safety evaluation system with big data as the core is lack of sufficient theoretical basis for accelerating the pace of food industry innovation hinders. Therefore, on the basis of understanding the existing food safety standard system, combined with the accumulated experience of the basic theory and practical development of three-dimensional space, this paper creates a standardized evaluation model, fully considers all aspects of food safety management, combined with practical evaluation content and specific data for verification analysis. The final results show that the construction and application of the evaluation model of food safety standard system based on big data is consistent with the development of The Times. It can help the employees of the department quickly grasp the problems encountered during food safety management, and provide theoretical support and industrial basis for the standardization construction and development of the food industry. Therefore, under the background of the new era, food enterprises should combine big data thinking technology. Research and discuss food safety standard system and evaluation model in line with their own development, pay attention to the full implementation in practice, so as to reduce unnecessary safety risks and fundamentally ensure food safety and quality.

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