

## Research on Risk Identification and Safety Supervision Management of Food Supply Chain

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### ABSTRACT

*How to identify potential food supply chain risk, identify critical control points, in order to effectively reduce or prevent the occurrence of food safety issues, is a problem for China's food safety supervision and management must be solved. From the food supply chain management perspective, this article presented, by the problem of food security in the event, via the causal path analysis, to ensure the key point of the food safety risk control on the basis of judging the weak links of the food supply chain, thus established a food safety and quality supervision system by the "oversight side - supervised party - food consumer" work together. Complemented by advanced technical support tools, food safety preventive measures will be true.*

### Keywords

Food supply chain risk, Risk identification, Critical control points, Food safety, Quality supervision and management.

### Introduction

In recent years, China's food safety problems have occurred frequently, and consumers are paying more and more attention to food safety. So, we have to start thinking about food safety responsibilities and food safety supervision models in China's food supply chain. Food safety problems cause serious losses to consumers, production enterprises and society, and this risk will be transmitted layer by layer along the food supply chain, which will eventually have a greater social impact. It is clear that the rationalization of food safety supervision is imperative. How to identify risks in the food supply chain and conduct effective supervision is not only a realistic problem that the government and food safety regulatory authorities need to solve, but also an academic subject for in-depth research by experts and scholars in the food field. Food safety is about people's lives, and ensuring food safety is the primary goal of food supply chain management.

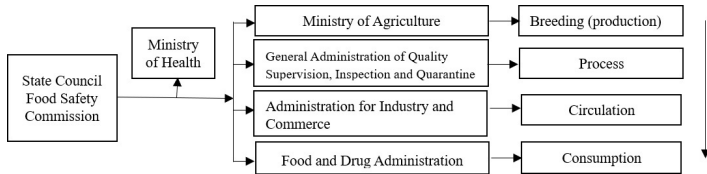
### Review on the Safety Supervision and Management System of Edible Agricultural Products in China The Status Quo of Safety Supervision and Management System of Edible Agricultural Products in China

Promulgation of laws and regulations such as the "Food Safety

Law of the People's Republic of China" (2009), the "Notice of the State Council on the Establishment of the Food Safety Committee of the State Council" (2010), and the "Reply on the Establishment of the Office of the Food Safety Committee of the State Council and Relevant Issues on the Adjustment of Responsibilities" (2011) as a sign, China's edible agricultural products have formed the current "segmented, diversified" safety management system. The "segmented" refers to the four stages of planting (production), processing, circulation and consumption of the edible agricultural product industry chain, which are managed by different departments respectively; while "diversification" means that the same stage or the same event will be jointly responsible by multiple departments. This "segmented, diversified" management system strengthens the management of edible agricultural products safety, but there are still problems in the actual operation process, such as: multi-sector management results in high supervision costs and poor coordination; sub-section management has scattered supervision and management functions, and it is difficult to achieve seamless supervision and responsibility traceability; security supervision work faces marginalization risks, and functional definition needs to be changed [1].

The safety supervision and management of edible agricultural products involves three market entities: the regulatory party (the government department responsible for the safety supervision of edible agricultural products), the regulated party (including

agricultural material production providers, agricultural product enterprises (farmers), processing plants, wholesale and retail enterprises, etc.) (ie participating companies in the supply chain), as well as consumers. From the perspective of supply chain management, the supervision and management of the safety supervision department on all aspects of the main edible agricultural product supply chain is shown in Figure 1.



**Figure 1:** Supervision of the segmentation diversification of the safety supervision department on the supply chain of edible agricultural products. Source: This study was organized by itself.

The safety incidents of edible agricultural products that have occurred in recent years mainly come from the processing link. In the process of edible agricultural products from the cultivation (production) to consumption, the departmental supervision of the processing links is the weak link of the safety supervision of edible agricultural products in China. Therefore, the processing link should be the most important area in the risk control of edible agricultural products supply chain.

In order to solve the shortcomings of the "segmented, diversified management and supervision" approach, and strengthen the unified management of the safe production of the food industry, according to the "Regulations on the Reform and Functional Transformation of the State Council" adopted on March 15, 2013, the State Council has established the State Food and Drug Administration to implement unified supervision and management of the safety and effectiveness of food and drug products in the processing, circulation and consumption sectors.

This new system of food safety supervision and management, under the unified leadership and coordination of the Food Safety Committee of the State Council, is mainly attended by the Ministry of Agriculture, food and drug supervision and management, and the health department. It has reduced the departments involved in supervision, integrated some regulatory resources, strengthen the supervision of the circulation link. It clarifies and strengthens departmental responsibilities and takes a big step toward a unified control system.

China's food safety supervision and management process has undergone major changes. But so far, there has not been any major changes in the way of supervision and management. For example, China's food safety supervision system has always been based on the three major departments of health, quality inspection and industry and commerce. These years, from the revision and improvement of the "Food Sanitation Law" to the introduction of the "Food Safety Law", the core of sub-regulation has not changed [2]; the formulation of food hygiene standards can't keep up with the needs of social development, and it is prone to blind spots in

monitoring and lack of pertinence and sensitivity of monitoring [3]; the technical personnel of the basic food safety supervision institutions fail to meet the required configuration requirements, the infrastructure is backward, the rapid monitoring capability is low, the number of grassroots supervisors is small, and a large number of safety supervision accidents are undertaken. It is impossible to truly supervise every food safety [4-6].

## Review on the Status Quo of Safety Supervision of Edible Agricultural Products in China

From the overall perspective of the safety supervision of edible agricultural products, no matter which problem occurs in the edible agricultural product supply chain, as long as problems are found and dealt with in any one or more of the links after this link, it is possible to avoid the problem that edible agricultural products appear on the consumer's table, and this is the fundamental purpose of the regulator. Therefore, the regulator should not only pay attention to the processing link, but also should work hard in the circulation and sales links, especially in the process of wholesale and retail. Once the problem of edible agricultural products is discovered, the wholesaler is penalized with sufficient force. In this way, the regulator will be more convenient to operate. Production and processing enterprises sell their products substantially across regions. Once problems occur, the place where the problem occurs and the place where the product is produced are often inconsistent, which brings great difficulties to the tracing by the regulator. And if you focus on the local wholesalers, you can reduce the cost of supervision and increase the regulatory benefits, and finally form a virtuous circle, and continuously enhance the level of enforcement of the regulators. On the other hand, in order to avoid a large amount of fines, wholesalers will naturally strictly control the purchase channels and strictly test the edible agricultural products. Strictly checking the additional costs incurred, the wholesalers will transfer some of the additional costs to the production and processing enterprises, which will increase the operating costs of small and medium-sized edible agricultural products production enterprises that lack quality control, thereby relatively enhancing the market competitiveness of large-scale formal edible agricultural products enterprises. This will facilitate the optimal integration of upstream companies. Wholesalers will also transfer part of the cost to the final consumer through the retailer, resulting in an increase in the market price of edible agricultural products, but this transfer will be very limited due to the high demand elasticity of most edible agricultural products [7]. The cost of not being transferred can only be digested internally, which will have an impact on the wholesale and retail market of edible agricultural products: small and micro-shop-style enterprises will be eliminated in large numbers, replaced by large and medium-sized edible agricultural products wholesale and retail enterprises with scale and quality control advantages; the edible agricultural product production and processing market is integrated. In this way, supervision and management can be carried out in a centralized manner, and the level of supervision is more effectively improved. The increase in the cost of enterprises in the upstream of the supply chain and the failure of the unqualified products of unscrupulous merchants will cut off the source of the problem products from the source,

and ultimately make the illegal businesses have no place in the market [8].

### Risk Identification of China's Edible Agricultural Products Supply Chain

The risk identification of the edible agricultural product supply chain refers to the classification of the potential risks faced by the edible agricultural product supply chain from different angles according to the principle of risk identification, and analyzes the causes and specific expressions of each risk. The edible agricultural product supply chain includes agricultural material production enterprises, agricultural product breeding (production) enterprises, processing manufacturers, wholesale retailers, transportation enterprises and final consumers, involving breeding (production), processing, circulation sales, consumption, etc. [6-7]. The complexity of the risk of edible agricultural product supply chain lies in the fact that there are many subjects involved in the supply chain, and there are many links, and the unique natural attributes of edible agricultural products that are prone to corruption and deterioration make the risk control more difficult.

How to effectively identify the potential risks in the edible agricultural product supply chain and determine the key points of risk control is the first step in its safety supervision and management. Only on the basis of identifying the risk of the supply chain, risk control measures and risk reduction can be implemented to achieve effective supervision and management of the safety of edible agricultural products [8-10].

The risk of edible agricultural product supply chain means that there are potential food safety hazards [11,12], and the link to the safety of edible agricultural products must be a risky link. The existence of the risk of edible agricultural product supply chain is a necessary and insufficient condition for the occurrence of its safety problems [13,14]. Based on this, this paper firstly summarizes the unqualified foods disclosed in the past year, finds some risk links, and then uses the fishbone diagram to conduct causal analysis, locate the key control points of risk, and make a comprehensive and accurate identification of potential risks in the food supply chain.

### Identification of risk links in edible agricultural product supply chain

This paper selects the quality inspection notice of the National Food Quality and Safety Network from October 2017 to September 2018 as the data source, and selects 15205 samples of unqualified samples of edible agricultural products. The sample data comes from all regions of the country, and there is no special concern for a certain area; the types of edible agricultural products are widely distributed, and there is no key research on the types of edible agricultural products; from the reasons for the unqualified sampling, there is no focus on a certain reason. The analysis of the selected data samples is objective and can comprehensively reflect the current situation of the quality and safety of edible agricultural products in China. Trace the supply chain links for each reason for the failure of the quality inspection report, initially identify the weak

links in the supply chain of edible agricultural products, analyze the causes of the problems, and find out the key control points.

Edible agricultural product supply chain	Unqualified quantity (example)	The proportion (%)
Breeding (production)	3909	25.71
Processing	6131	40.32
Circulation and sales	5165	33.97
Consumption	0	0.00
Total	15205	100.00

**Table 1:** Distribution of unqualified edible agricultural products in the supply chain. Source: This study was organized by itself.

It can be seen from Table 1 that the reason for sampling unqualified edible agricultural products is that the most frequent occurrence of quality and safety problems of edible agricultural products in China is the processing link (the number of unqualified products in sampling inspection accounts for the proportion of unqualified products in the four links of edible agricultural product supply chain is 40.32%), circulation and sales links (the number of unqualified products in the sampling inspection accounted for 33.97% of the number of unqualified products in the four links of the edible agricultural product supply chain), and the breeding (production) link (the number of unqualified products in the sampling inspection accounted for The proportion of unqualified products in the four links of agricultural product supply chain is 25.71%) [15]. From the data obtained by the food quality inspection agency, the consumption link is not involved, and there is no problem to reflect. The edible agricultural product processing link here refers to the various operation links that change the shape, size, nature or purity of the edible agricultural product raw materials or semi-finished products to meet the standards of edible agricultural products [16].

### Processing

It can be seen from Table 1 that there are 6,131 batches of unqualified edible agricultural products in the processing chain, accounting for 40.32% of all unqualified batches. It is the main component of the unqualified quality of edible agricultural products, and should also be one of the main link of risk control [17]. The reason for the breakdown can be seen: the problem of processing is mainly concentrated on excessive or illegal use of additives; the sterilization process is not strict; the environment and production process do not meet the hygiene standards; the batching process is not strict, adulterated, and the operation does not meet Health requirements, etc.

### Circulation and Sales

As can be seen from Table 1, 5165 batches of edible agricultural products in the circulation and sales links accounted for 33.97% of all unqualified batches. The reason for the breakdown is that the problems of circulation and sales are mainly concentrated on the sale of agricultural products that have deteriorated or exceeded the shelf life; the storage and preservation methods of edible agricultural products are improper; the packaging materials are

damaged during transportation; the sanitary environment cannot meet the hygiene requirements (it is easy to cause microbiological indicators such as *Escherichia coli*, mold and *Staphylococcus aureus* to exceed the standard); the label of edible agricultural products is not used in accordance with relevant national laws and regulations.

### Breeding (Production)

It can be seen from Table 1 that there are 3,909 batches of unqualified edible agricultural products in the breeding (production) segment, accounting for 25.71% of all unqualified batches. As the initial source of the food supply chain, the proportion of problems in the breeding (production) process is so high that we have to be alert. The potential hidden dangers in the breeding (production) process mainly come from pesticide pollution of edible agricultural products; irrational application of chemical fertilizers; veterinary drug residues in animal products; heavy metal pollution in fresh seafood.

### Analysis of the causes of the risk of edible agricultural product supply chain

#### Improper use of agricultural materials

Improper use of agricultural materials in the safety of edible agricultural products mainly manifests as pesticide pollution, irrational application of chemical fertilizers, veterinary drug residues in animal products, and heavy metal pollution in fresh seafood. Concentrated on the use of pesticides, fertilizers, veterinary drugs, etc. in excess or in violation of regulations. Some studies have pointed out that the safety factors of such edible agricultural products are significantly higher than other factors, which is the most important reason for the quality of edible agricultural products [18]. In order to reduce the adverse effects of pests and diseases on crops, pesticides are widely used in agricultural production, and the cost of non-toxic and harmless agricultural materials is high and it is difficult to widely promote them. Therefore, under the driving of speculative psychology, edible agricultural product breeding (production) enterprises overuse harmful agricultural materials with low prices, and it is impossible to ensure that the edible agricultural products are safe and harmless from the beginning of the field.

#### Excessive or illegal use of additives

One of the outstanding problems in the processing chain is the excessive or illegal use of additives. China has a relatively complete food additive safety evaluation system. The food additives allowed in China's national standards have been evaluated for safety. However, even if it meets the national standards for food additives, excessive use will cause serious harm to the human body. For example, nitrite, which is commonly used in meat production, can form nitrite amine when it is combined with an amine. It can cause cancer when consumed in excess. Taking the "Clenbuterol" event, which is well known to consumers, as an example, the use of certain additives that have not been evaluated for safety in foods is more harmful than the excessive use of legal food additives. Most of the safety issues of all kinds of edible agricultural products that we know are due to this problem. In the processing and production process, there are too many types of edible additives to be used,

and the identification is difficult; and because of the confidentiality and hygienic requirements of the business, the use of food-usable additives is also a hidden operation, which increases the difficulty of supervision.

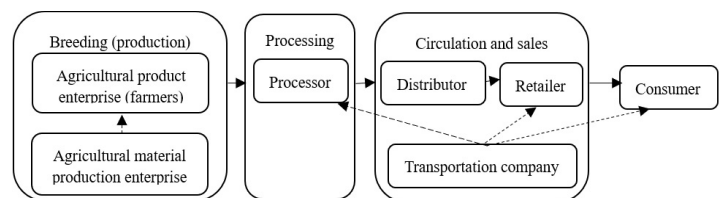
The negligence of some regulatory links has led to speculation by some unscrupulous merchants: excessive use of food-available additives, illegal use of illegal additives for profiteering [19-21]. At present, the inspection of the safety supervision of edible agricultural products in China is generally only for the final product. However, due to the aging and idleness of the additive testing equipment, the monitoring of the safety of edible agricultural products has great loopholes. In addition, the current sub-sectoral supervision system has caused unclear responsibilities and regulatory gaps between the regulatory authorities, and the lack of traceability mechanisms for strict consumption of agricultural products [22] has made it more difficult to monitor safety.

### Environmental and production processes are not up to standard

Many unqualified reasons in the quality inspection were concentrated on the total number of bacteria exceeding the standard, the mold exceeded the standard, and the *E. coli* exceeded the standard. This is mainly due to the large number of small workshops in the production of edible agricultural products in China. Poor sanitation, improper operation of operators, production and unlicensed operation are serious, and production quality is difficult to guarantee. Due to unsanitary production environment, raw materials are easily contaminated, sterilization process is not strict, and edible agricultural products are susceptible to microbial contamination in the entire supply chain such as processing and sales.

### Critical control point analysis

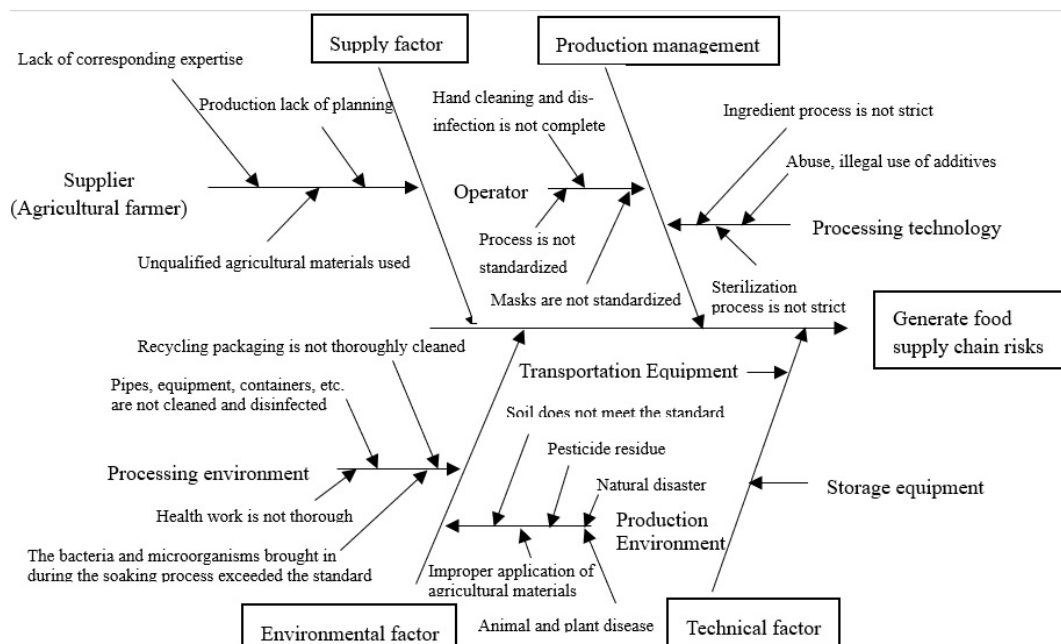
Figure 2 shows the main supply chain links of edible agricultural products in China and the organization diagrams involved in them. As can be seen from the figure, the entire edible agricultural product supply chain can be divided into four links. The enterprises and individuals directly involved in the supply chain are: agricultural material producers, agricultural product breeding (production) enterprises, processors, distributors, retailers, transportation companies and consumers. Agricultural material production enterprises and transportation enterprises are indirectly involved in ensuring the smooth flow of the supply chain.



**Figure 2:** Structure diagram of edible agricultural product supply chain. Source: This study was organized by itself.

The division of the edible agricultural product supply chain is relatively simple, but spans the first, second and third industries.





**Figure 3:** Path analysis of the risk of edible agricultural product supply chain. Source: This study was organized by itself.

The production scale of edible agricultural products is small and highly dispersed, and there are many paths from producers to consumers, which are difficult to manage, which further increases the risk hidden in various links and various factors [23]. The causal relationship between the hidden potential risks in the edible agricultural product supply chain is shown in Figure 3.

According to the risk path and causal relationship expressed in Figure 3, we can roughly classify the risk factors from the four layers and identify the risk points in the corresponding edible agricultural product supply chain: 1) supply factors; 2) production management; 3) Environmental factors; 4) technical factors [24-26].

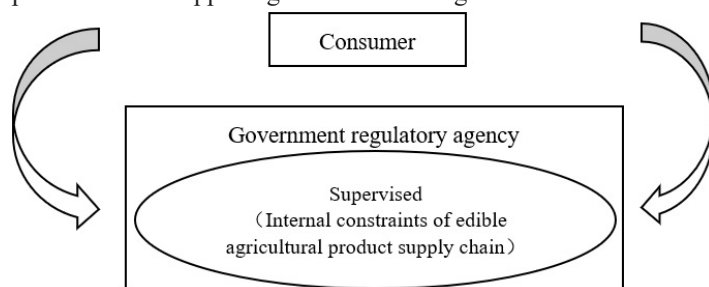
Lack of professional knowledge, lack of planning, and the pursuit of interests drive farmers to choose unreasonable agricultural materials. In the production management, the operators themselves are not completely disinfected, the process operation is not standardized, the batching process and the sterilization process are not strict. In the production environment, soil conditions do not meet the standards, there are pesticide residues and hidden dangers of animal and plant epidemics etc.; pipelines and other equipment are not cleaned and disinfected thoroughly, microorganisms are brought into excessive standards during soaking, recycling packaging is not thoroughly cleaned, and sanitary conditions are not good. In the technical factors, the transportation equipment and warehouse storage equipment are imperfections; speculation in distributors and retailers lead to sales deterioration of edible agricultural products, etc. These are all possible causes of quality problems and a potential risk point for the edible agricultural product supply chain.

In summary, the identification of the causes of the weak chain of edible agricultural product supply chain and the quality and safety of edible agricultural products, with reference to the potential

risk point of the edible agricultural product supply chain derived from the causal analysis method, the focus of safety regulation of edible agricultural products should be at the risk control of key points in the supply chain. These key control points include: the breeding farmer's lack of professional knowledge or interests to drive the use of unreasonable agricultural materials; the batching process is not strict, the additives violate the relevant laws and regulations; the operators themselves are not completely disinfected, the sterilization process is not strict, and the bacterial colonies exceeding the standard due to poor sanitary conditions in the processing environment; unqualified transportation equipment and warehouse storage equipment cause deterioration of edible agricultural products.

### Safety supervision and management of edible agricultural product supply chain

Establishing a reasonable and effective supervision and management model requires three market entities widely involved in the edible agricultural product safety supervision system: the regulator, the regulated party and the consumers. The three market players must make a difference at the same time, and the three-pronged approach can prevent the safety of edible agricultural products from happening. As shown in Figure 4.



**Figure 4:** Safety supervision mode of edible agricultural product supply chain. Source: This study was organized by itself.

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### **Supervised level**

This level is composed of participating enterprises in the edible agricultural product supply chain, and its internal self-discipline is the first powerful barrier for the safety supervision and management of edible agricultural products.

### **Establish a unified product quality standard system within the edible agricultural product supply chain**

“The Food Safety Law” promulgated in 2009, as a “supreme law” in the food field, established a unified standard. The first regulation constrained all laws and regulations and avoided the safety issues arising from inconsistencies in multiple legal provisions and technical guidelines. It is the basis of all actions. Companies need to follow certain guidelines. In order to ensure that a supply chain with uniform quality standards for edible agricultural products can be constructed, appropriate quality standards should be implemented regardless of which part of the supply chain or which product is produced or operated. The international standard throughout the food supply chain, ISO22000 (“Food Safety Management System”) should be fully implemented as soon as possible.

The standard includes such things as communication between each other, management of the system, control of the process, hazard analysis and key control point (HACCP) principles and prerequisite programs. If the participants in the supply chain are able to establish a system with reference to the ISO22000 standard and adhere to it, effective safety supervision and management of edible agricultural products can be achieved.

### **Improve the degree of intensification of enterprises in the edible agricultural product supply chain**

The enterprises in China's edible agricultural product supply chain are small in scale and relatively scattered. Obviously, the strengthening of the safety management of edible agricultural products will undoubtedly increase the cost of safety supervision and management, and the effectiveness of safety protection is minimal. Therefore, with the improvement of the level of enterprise informatization, we will cultivate and expand the leading enterprises in the edible agricultural product supply chain, in order to make them bigger and stronger, become modern agricultural enterprises, and gradually replace the scattered, individual farmer household-style small enterprises. Increasing the intensification of edible agricultural products production enterprises will provide a strong guarantee for the safety of edible agricultural products [27].

### **Introduce a third-party authentication mechanism**

Third-party certification can not only ensure that there is no safety problem in edible agricultural products, but also in the event of a bad accident, because the third-party certification mark can quickly identify which part of the edible agricultural product supply chain is responsible, so that the safety of edible agricultural products is traceable. Drawing on the food supply chain management model of the United States, Japan and other countries, the third-party certification body will carry out quality control before the edible agricultural products reach the consumers, which can prevent the

unqualified problem of eating agricultural products into the market and endanger the lives of consumers [28,29].

### **Government Regulation**

Drawing on the progress of food safety promotion in western developed countries, the food safety supervision system was established by the joint efforts of all relevant members of the supply chain under the advocacy of relevant state regulatory authorities [30,31].

### **Strengthening the legal system and improving the laws related to food safety**

China's food safety supervision and management legal system is relatively lagging behind, lacking the cohesion and coherence between laws and regulations. Food processing companies use the flaws of the law to speculate and harm the interests of consumers. For food safety legislation, we should pay attention to the real-time monitoring of the status quo of food safety, and timely amend the legislation based on the current situation and future trends. The perfection of laws and regulations should be an ever-changing and continuous process. The improvement of food safety related laws will also guide enterprises in the edible agricultural product supply chain to gradually regulate their own behaviors, and then the safety risks of edible agricultural products will gradually decrease, and the occurrence of food safety problems will be reduced.

### **Strengthen the enforcement of regulatory authorities in circulation and sales**

Strict regulation of circulation and sales links can prevent problematic agricultural products from reaching consumers, which can reduce the incidence of food safety problems and the social impact of safety issues. Strengthening the enforcement of the regulatory authorities in the circulation and sales links can reduce regulatory costs and increase regulatory revenues. Wholesalers and retailers of edible agricultural products will strictly control the quality of the purchase channels in order to avoid the punishment of the responsibility, and the unscrupulous merchants will gradually be eliminated by the market because they have no sales channels. The production and processing market for edible agricultural products has been integrated, and supervision and management have been concentrated, which in turn will effectively raise the level of supervision and eventually form a virtuous circle.

### **Clarify the duties of the regulatory authorities**

Supervision of every link in the edible agricultural product supply chain is carried out by multiple regulatory authorities. “The Food Safety Law” stipulates that once illegal activities are found, the food safety supervision and administration department shall carry out separate management according to their respective duties; in the event of a food safety accident, the quality supervision department, the health management department, and the industrial and commercial administrative department may conduct supervision and management. But it also means that every department has the potential to shirk its responsibility and form a “vacuum zone”, resulting in no department to solve the problem. Therefore, it is necessary to clarify the scope of management responsibilities

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of each regulatory department, and clearly stipulate which type of problem is supervised and managed by which regulatory department, in order to prevent the situation of “kicking the ball” in various departments.

### **Unified food inspection system**

The Food Safety Law mainly regulates the food inspection system from four aspects, namely the qualification of the inspection institution; the inspection rules; the legal responsibility of the inspection agency; the exemption from inspection and the prohibition of charging fees. However, the provisions of the Food Safety Law on food inspection systems do not apply to edible agricultural products. First, the basic principle of the applicable relationship between the Food Safety Law and the Agricultural Products Quality and Safety Law is that “the two laws are in parallel”. Therefore, the inspection of edible agricultural products should use the Agricultural Product Quality and Safety Law. Second, Article 57 of the Food Safety Law makes an exception to the qualifications of inspection institutions, that is, “except as otherwise provided by law”. The qualification certification of agricultural product quality and safety testing institutions has corresponding provisions in the "Agricultural Product Quality and Safety Law", which is in compliance with "except as otherwise provided by law". Thirdly, when the Food Safety Law lists the subjects of sampling, it only lists the “administration department for industry and commerce, the quality supervision department, the food and drug supervision and administration department, and does not include the agricultural sector. Therefore, the establishment of a unified inspection system for edible agricultural products will help eliminate the occurrence of possible problems and reduce unnecessary regulatory troubles.

### **Consumer supervision**

At present, due to the gap between China's consumers' income level, knowledge level, security awareness and other developed countries, China's consumer behavior is less effective in promoting the safety of edible agricultural products than developed countries such as Europe and the United States. However, the safety supervision function of consumers on edible agricultural products is clear. This kind of safety supervision function mainly includes two aspects: consumer reports, complaints, etc. can provide information and clues for the safety supervision of edible agricultural products; consumers can influence the production behavior of enterprises in the edible agricultural product supply chain through purchase behavior. Studies have shown that consumer purchasing activities have greatly promoted the safety of edible agricultural products. Therefore, consumers should be fully guided to establish a sense of supervision, thus establishing a third barrier to the safety supervision of edible agricultural products.

### **Security measures**

#### **Establish a complete traceability system**

Traceability systems include both traceability and tracking. The system records information on all processes from raw material production to final consumption of finished products. If a problem occurs, the company can quickly understand the whereabouts of

edible agricultural products, take back the problematic products without consumption, revoke its marketing authorization, eliminate the hazards, and reduce the loss of the edible agricultural product safety system.

The wide application of radio frequency identification (FDIR) technology in various industries can also be introduced into the safety supervision of edible agricultural products [32]. The electronic label technology can effectively identify and describe the edible agricultural products in the process of production, storage and transportation. The relevant information records on edible agricultural products are stored in the electronic label, which makes the different edible agricultural products have their own unique “identity card”, which will provide a strong guarantee for the safety of the edible agricultural products themselves. Once the safety of edible agricultural products occurs, you can quickly find the problematic situation, quickly track the flow of the problem product, recover the problem product, and minimize social harm.

#### **Building a rapid response information platform for responding to food safety accidents**

The construction of food safety supervision and management system requires “timely response”, that is, the system should be operated in a timely manner, the nature of the accident should be determined in a timely manner, the information should be released in a timely manner, and the results should be processed in a timely manner. Achieving this goal requires open, free and rapid flow of information. Therefore, the “safety supervision and management system for edible agricultural products” must be based on an effective platform [23] to enable rapid integration and rapid sharing of safety information throughout the edible agricultural product supply chain [33-35].

### **Conclusion**

Compared with other industries, research on risk management of edible agricultural products supply chain is still in its infancy. The edible agricultural product supply chain is more fragile and complicated than the supply chain of other industries because of its special attributes.

In order to improve the income of various entities in the edible agricultural product supply chain, the risk management of its supply chain must proceed from the whole, fully identify, comprehensively analyze the potential risks in the processing chain, circulation and sales links, and breeding (production) links in the supply chain, identify the causes of various risks and their key control points, and take targeted measures to prevent them, so as to effectively reduce and eliminate risks.

The construction of the safety supervision and management system for edible agricultural products is a complex system engineering. Three market entities (regulators, regulated parties and consumers) in the safety supervision system for agricultural products need to be constructed together, and a three-pronged approach can achieve good results.

In the effective food safety supervision system, the complete agricultural product information traceability system and the rapid response information platform for dealing with food agricultural safety accidents are indispensable important safeguards. The rapid integration and rapid sharing of food safety information across its entire supply chain will minimize the social harm of food safety issues.

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