Study on the Countermeasures of Improving the Quality and Safety of Chinese Tea from the Perspective of Digitalization

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Abstract: China is the largest tea producer and consumer in the world. The annual tea production and sales is more than millions of tons. No matter the growing area of tea or tea consumption are ranked first in the world. In recent years, with the improvement of people's material living standard, the notion that "drinking tea is good for health" and paying attention to food quality deeply rooted in people's hearts. Tea market put forward higher requirements for the quality of tea, China's tea quality and safety issues have been paid more and more attention. The quality of tea produced in China is generally better, but there are more local hidden dangers. After entering the digital age, all industries are carrying out digital transformation, including tea industry. Digitalization to improve the quality and safety of tea in China provides a new way out of development. This paper analyzes and discusses the digital vision to improve the significance of tea quality and safety and the main problem at present, and put forward a strategy to improve the quality and safety of tea in China, with a view to providing theoretical support for the future improvement of tea quality and safety.

Keywords: Digitization; China's tea quality; Safety countermeasures research

1. Introduction

With the advent of the digital age, digital technology has developed rapidly, followed by the rise of the digital economy. Big data technology has changed people's way of life, but also the production pattern. The digital wave swept all walks of life, and the global industry has undergone varying degrees of change. As China's traditional advantage industry, the tea industry is also actively adapting to the development of the digital age, and constantly strengthen the information construction of the tea industry. The development of digital technology is of great significance to the improvement of tea quality and safety in China. In the process of tea producing, the use of digital technology can promote the transmission of information, which is conducive to providing market trade information for tea farmers, but also can apply digital technology to tea cultivation, improving the safety of tea production efficiency. Therefore, it is very necessary to study the improvement of tea quality and safety in China under the digital view field.

2. The Meaning of Improving the Quality and Safety of Tea in Digitization

2.1. Food safety is valued

In recent years, the development of digital technology makes our country gradually stepping into the digital era. With the development of our country's economy, people's living standard is getting better and better. The demand for food is getting higher and higher. Food safety has become the main problem in food production and consumption. Food quality related to the assurance of food quality standards. It is necessary to avoid residues of substances harmful to the human body. Food safety is attached great importance. Meanwhile, the quality of tea cannot be ignored. Tea quality and safety concerns the health of the vast number of people and the vigorous development of the entire tea industry. Therefore, no matter tea farmers or tea enterprises and even government departments should pay more attention to the quality and safety of tea in order to improve the quality level of tea.

2.2. Tea exports encounter green barriers

Tea is good for spleen and lung. It is welcomed not only by the Chinese people, but also has gradually become a respected beverage in many countries and regions in the world. The international market demand for tea is broad. China is not only a big consumer of tea, but also a big exporter. In recent years, China's tea export trade has expanded rapidly. Tea export trade has further promoted the region's economic development, and in the share of economic development it occupies a higher proportion. However, with the development of global trade liberalization and digital technology, Europe and the United States that is major importer of tea countries have mostly formulated more stringent tea quality inspection stan-

dards. This "green barrier" existing in the tea trade is a new type of technical barriers. Undoubtedly, it greatly challenges China's tea export trade, increasing the development of domestic tea manufacturers pressure. In order to improve the international competitiveness of China's tea products and increase the share of tea in the international market, the government should vigorously improve the level of tea safety and quality. The shortage of tea bases that meet the requirements of European food procurement and the increasingly strict green barriers force China to adjust the export structure of tea in time and strengthen quality and safety management in the process of tea production and processing.

2.3. The inevitable demand for the economic development of the tea industry

In recent years, China has entered the digital age. The biggest characteristic of the digital era is rich in information and fast dissemination. The advance of the times in China's tea industry provide more stringent requirements. Tea industry is an important economic source in several major provinces in China, such as Fujian and Guangdong provinces. The development of tea industry can not only increase residents' income, but also maintain social stability. At present, consumers pay more attention to food safety awareness. Consumers will inevitably take quality and safety as the primary consideration in purchasing tea. In this context, only by improving the quality and safety of tea can attract a large number of consumers and taking it as a selling point so as to promote the development of the tea industry economy.

3. The Main Problems Existed in Current Tea Quality and Safety

3.1. There are quality problems in production and processing and lacking of quality traceability system

During production, tea farmers' awareness of tea quality is weak. In the selection of tea planting base, they did not fully take into account the soil, climate and other factors affecting the tea quality. Environmental pollution caused by tea cultivation will directly lead to the reduction of tea quality. Many people don't use chemical pesticides correctly. There are many blind spots and problems, such as blind mixing of pesticides, unclear dosage, too long safety interval, etc. In the process of processing, packaging, transportation and preservation, tea will have the risk of pollution again. In the process of buying raw materials, production, quality inspection and other procedures, some enterprises seeking interests wantonly reduce some standard requirements. What's more, fraud is done in the raw materials pesticide inspection, resulting in a part of China's tea quality deviated from national quality standards. According to statistics of relevant departments,

only t 90%tea products in current domestic tea production is in line with national quality standards.

In addition, China's tea quality traceability system is not perfect and is not conducive to the tea quality. A comprehensive tea traceability system can clearly present the origin, manufacturers, retailers, brands and every participant including consumers. It can ensure the transparency of tea product information. In the tea industry, it is difficult to achieve the true traceability of tea information in the whole process and all links. So, it is not conducive to the improvement of tea safety quality.

3.2. Loose supervision and the lack of a sound tea quality supervision system

In recent years, with the concept of food safety rooted in the hearts of the people, China's regulatory authorities gradually pay attention to the quality of tea supervision work. But the quality of tea supervision still needs to be improved. All the time, food and drug regulatory authorities don't have enough supervision for the tea quality. China's tea cultivation and production and processing are mostly done by small-scale tea farmers. This loose tea cultivation and processing process will inevitably restrict the standard and safety of tea production. Tea farmers are not conducive to the decentralization of the unified supervision of the regulatory authorities. Regulators have taken regular inspection on the tea quality of. A long interval between the regular inspection is not conducive to the overall supervision of tea quality. Perfect tea quality supervision system is an important guarantee for the improvement of tea safety, and China has not yet formed a perfect tea quality supervision and management system. Tea testing standards need to be updated in a timely manner. The development of the digital age has promoted the integration of the world economy, so that the standard of tea quality in the international market has been raised, and the standard of tea monitoring and supervision in China has not adapted to the development of the present era.

3.3. Hazardous substances residue exceeded the standard, and tea safety quality level needs to be improved

At present, harmful substances in China's tea mainly include pesticides, heavy metals, harmful microorganisms, and so on. The pesticide residue problem of tea in China is common, and the residue of harmful substances exceeds the standard, which becomes the biggest obstacle to the improvement of tea quality in China. In order to resist disease and insect disasters, tea farmers in the cultivation of tea generally will apply a large number of chemical pesticides, which residues seriously reduce the quality level of tea in China; in recent years, the overproof of harmful metal especially lead tolerance has a tendency of increasing. Air and soil pollution make the

ecology in tea planting worse; the development of the digital age makes the international requirements for harmful microorganisms more stringent standards. Harmful microorganisms have been detected in China's export of tea; non-tea thing is the mainly resource of physical harm. Internationally, it is ruled that non-tea things mustn't be found in tea. But part of companies add artificial color or other dopant to get illegal interests and downgrade the tea quality.

4. Strategies to Improve the Quality of Tea in Digitization

The development of digital technology has put forward higher requirements for tea quality, and the quality of tea in China still occur from time to time. In order to further improve the tea quality, eliminate the possible quality hazards in the tea industry, it is necessary to promote the development of tea industry in accordance with the current major problems in China. We must cultivate quality and safety awareness, improve the construction of tea traceability system, promote the digital upgrading of the tea industry chain.

4.1. Cultivate quality and safety awareness and improve the tea traceability system construction

The tea industry should actively publicize the importance of tea quality, improve the safety awareness, standardize the behavior of all departments. All departments of the tea industry should increase the publicity of tea quality and safety knowledge. We can use the issuance of notices, brochures and other forms to express tea quality and safety knowledge and its importance to each tea farmer, to ensure the full coverage of publicity activities. For the main body of tea production, tea enterprises should strengthen self-discipline, taking the quality and safety of tea as a lifeline from enterprise development, to ensure that quality and safety can be ensured in all aspects of tea production and sales. Enterprises should vigorously promote tea industry cultivation, processing and other industry chain clean. They should actively encourage tea producers to sign a clear industry convention with enterprises. Self-discipline should be vigorously promoted. In the convention, the regulation power of enterprise in planting, processing and sales should be clearly defined to promote all aspects in a standardized construction and improve the overall level of tea quality and safety.

In addition, the regulatory authorities should formulate a unified tea quality standard. According to the unique nature of tea production and circulation, tea quality and safety standards should be clarified and a special tea quality supervision platform should be established. In all aspects of the tea industry, using advanced big data technology achieves the interconnection of data information. Taking the general knowledge of tea products as a goal, data collection indicators and transmission format should be unified, and a special tea traceability regulatory platform should be established. We should also use big data to promote the establishment of traceable data sharing mechanism, realize the interconnection of tea data information, and innovate its query methods, to provide the public with a one-stop convenient service to query traceability information.

4.2. Implement the tea quality supervision strictly and spot check system, improve the tea quality and safety supervision system

To improve the quality and safety of tea, we must carry out strict supervision and spot checks, so the national and local quality supervision departments should supervise regularly or irregularly and spot check the quality of tea products. In the actual supervision of spot check, we can check the finished products of tea production warehouse, or the supermarket shelves in shopping malls to carry out random sampling. Strict tea quality supervision and spot check system can guarantee the quality tea products. The relevant departments should not only supervise the quality of tea products, but also constantly strengthen the tea cultivation and production environment and other safety indicators involved in the detection, including the tea pesticide residues, heavy metals, harmful microorganisms, fluorine and other harmful substances testing. The food and drug regulatory department should also attach great importance to the quality and safety supervision of tea, strengthen the daily supervision of tea quality, increase the intensity of sampling and monitoring, and promote the stability of tea quality and safety level.

In addition, tea quality and safety management system can be established by promoting the certification of tea quality. The tea industry should vigorously promote a variety of quality certification, such as the implementation of ISO9000, ISOl4000, GMP (good production practices) and other internationally accepted food quality certification, and continuously improve the quality and safety of tea products. China's tea industry should actively apply for pollution-free, green food and organic tea certification, based on certification standards to continuously improve the safety and quality of tea. Regulators should straighten out their respective responsibilities and cooperate with each other to form a joint effort to build a clear responsibility of tea quality and safety supervision system. It is also necessary to accurately establish the tea quality and safety management system in line with foreign countries. Unified standards can not only improve the quality and safety of Tea in China, but also meet the international requirements for the quality of tea. Fundamentally, it can enhance the international competitiveness of Tea in China. Breaking through this "green barrier" and improving the scale of trade in tea exports can let China's tea industry develop stably and prosperously, which has an extremely important practical significance.

4.3. Establishing an ecological tea garden ensure the quality and safety of the source of tea

At present, China's tea quality testing costs are high. So, to improve the quality of tea needs to establish an ecological tea garden, to ensure the quality and safety of tea from the source. We must first optimize the planting environment of tea and establish an ecological tea garden. In the process of tea cultivation, first of all, we should actively comprehensively control pests and diseases. In the actual pest control work green control should be implemented. Keeping the ecological balance of tea garden doesn't mean eliminating all harmful organisms. Pest and disease physical control measures can be actively adopted. Trying to use plant and mineral source pesticides, reducing the use of chemical pesticides can improve and protect the production environment of tea, reduce the pesticide residue of tea, optimize the quality of tea. Secondly, it is necessary to create a protective forest around the tea garden scientifically and rationally, and form a complex ecosystem suitable for the safe growth of tea leaves. It is essential to play the role of protective forest in resisting industrial waste pollution, increasing the soil organic matter of tea garden, improving soil structure, optimizing the tea garden environment and promoting the improvement of tea quality. Finally, we should pay attention to the scientific and rational use of fertilizer. The use of formula fertilization cam promote the balanced supply of soil nutrients, reduce pollution of the tea garden environment, promote the activity of microorganisms in the soil, improve soil quality, reduce the presence of harmful microorganisms in tea. In addition, in the process of tea processing we should pay attention to prevent the emergence of processing pollution, vigorously promote the clean processing technology of tea, to maintain the clean and hygienic tea processing workshop and prevent the entry of pollutants. We can also promote the quality and safety of tea by playing the role of organization. Small scattered tea farmers gathered together in accordance with the unified standard processing to actively guide the main body of tea production to join the appropriate organizational form, to ensure the safety standards of tea processing process.

4.4. The introduction of digital technology can promote the digital upgrading of the tea industry chain

The introduction of digital technology can promote the digital upgrading of the tea industry chain, accelerate the digital transformation of the tea industry, and, to a certain extent, promote the improvement of the quality and safety level of tea. The first step is to improve the network environment of the whole tea growing base coverage area. Most of China's tea-growing areas are remote rural areas. Therefore, we must speed up network infrastructure construction, promote rural areas, especially tea-growing areas of the network supporting upgrading. Through the digital upgrading of the tea industry chain, we can strengthen the tea production and sales of the whole process of standardized testing, improve the quality and safety of the tea industry. Digital technology can be actively introduced and the application of digital technology and new products in the field of the tea industry can be increased in intelligent agricultural machinery and equipment such as monitoring sensors, agricultural cameras, explore blockchain, 5G technology and other digital technology so as to promote the standardization and standardization of tea production process.

In addition, the government should vigorously introduce tea technology. Research and development of tea cultivation and processing technology can be made according to the tea market demand. With new, high-quality tea varieties and new advanced technologies the quality and safety of China's tea products can be improved. We can encourage agricultural research institutes to go deep into the tea base and give full play to the leading role of technical personnel. We should cultivate agricultural digital technology talents, attract talents to bring advanced planting techniques and agricultural equipment into tea plantations, train tea farmers in information technology, and improve the level of tea safety and quality at the source of cultivation. The introduction of digital technology can also make full use of the Internet to achieve the convenient and efficient cultivation training. Tea farmers can learn on the network tea planting environment selection, pesticide ratio, tea production and other scientific knowledge. With the help of digital technology pollution-free tea standardized production can be established, the safety of tea farmers safety production skills can be improved, the improvement of tea safety and quality level can be promoted.

To sum up, digital technology has promoted the integration process of the world economy. The quality requirements of tea standards have become more stringent. Tea quality and safety level should follow the pace of the times. The quality and safety of tea is not only related to the vital interests of consumers, but also related to the employment of relevant personnel and the development of the tea industry. We must take a variety of measures to strictly protect. At present, China's tea quality and safety status quo is still not satisfactory. Tea quality and safety situation is generally better, but there still has many safety risk. This paper analyzes the main problems existing in the quality and safety of tea in China in depth, and studies the countermeasures for improving the level of safety and quality, in an attempt to open up new ideas for the improvement of tea quality and safety.

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