

Research Article

Research on the Agricultural Products Traceability in China

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Abstract: This study find the problems and defects of the implementation of traceability for agricultural products in China through comparison between China and developed countries for the research achievements about agricultural products traceability. And put forward some proposals focusing on consumer to promote the implementation of traceability after analyzing the important role of consumer in the process.

Keywords: Agricultural products, confidence, consumer, traceability

INTRODUCTION

The quality safety problem of agricultural products has always been the focus of all walks of life and it make impact on health and life security of residents and with the occurrence of current frequent food safety problems, consumers need to know if agricultural products they buy are safety. Besides, with the improvement of healthy consumption idea and the people living standard, consumers tend to buy agricultural products with higher security, although their prices are likely to be doubled. Thus, some countries and regions design agricultural products traceability system to get the goal of real-time tracking, quality control and passing the safety information to consumers.

Traceability system was firstly used in recall system of cars, aircraft and other industrial products. The EU proposed product traceability system of cattle and beef as early as in 2000, which was the first time to put forward that traceability of food should be taken into the legal system. After that, scope of traceability extended to the entire food and specifically banned the import of products with no traceability (Wang *et al.*, 2007). In order to realize the food traceability system, FDA in America gradually completed registering for related companies and individuals in all domestic and international food industry and require recording and preserving of the whole circulation process information of food (Smith *et al.*, 2005). The traceability system in Japan is mainly under the control of the government (Kine *et al.*, 2013). It firstly introduced traceability mechanism in beef production supply chain. From the farm to the retail link had to execute compulsorily. Consumers could get the production information through code query. From then, the agricultural

products traceability system have already been accepted by the consumers. In recent 10 years, traceability system in food safety management in the developed countries and some districts has a rapid development, in addition to the earlier European Union, the United States and Japan, Canada, New Zealand, Australia, the Netherlands and other agricultural production powers have set up food supply chain traceability system.

In China, it started to explore agricultural products quality safety traceability system in 2002. From 2003 to 2004, the ministry of agriculture respectively started farming system and chose Beijing, Tianjin, Shanghai and other cities as the experiment cities for quality safety traceability system. Then, the ministry of agriculture, general administration of quality supervision, food and drug administration and other departments issued a series of related system and standards of the quality traceability of agricultural products and built multiple local agricultural products quality traceability platform (Wang *et al.*, 2005). For example, Beijing established "the beef product traceability pilot", the project is made up of production management system and the public traceability database, which make coding identification and information collection for each link from farm to meat consumption and construct a public service platform for the government, enterprises and consumers to achieve food supply chain traceability System from farm to table (Chen, 2007). At present, the implementations of the agricultural products traceability are mainly concentrated in big cities and it is in line with the current economic level and consumption habit.

Agricultural products traceability mainly refers that in the process of the production, transmission and distribution of agricultural products, collect and record related information to form a complete information

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chain for agricultural products which help control the quality of agricultural products and when security problem happens, it can provide useful information to find causes (Tu and Wang, 2011). The implementation basis of traceability is based on the reality and effectiveness of security information. Agricultural products traceability system is conducive to real-time supervision for government and help enterprises improve the product competitiveness with larger impact. Because of few researches on agricultural products traceability in China, certain problems about the effective implementation of traceability exist, which should be badly solved. So this study aims to put forward some valuable measures from a consumer's point to help promote the implementation of traceability for agricultural products through analyzing the comparisons of the current implementation situations in China and developed country.

MATERIALS AND METHODS

Characteristic analysis on agricultural products traceability: It has a fixed process basically for agricultural products circulating from producer to the

final consumer and traceability includes forward traceability and backward traceability (Zhang *et al.*, 2011). The basic schematic diagram is shown in Fig. 1. But, in China, it is hard to carry out agricultural products traceability; the reasons are as follows (Zhang *et al.*, 2010):

- Planting and breeding of agricultural products are not large scale
- Government supervision mechanism is imperfect and the scattered regulatory links lead to the failure of unified regulatory chains
- The traceability standard is not unified
- Information infrastructure cost is high. Therefore, it needs to take comparative analysis on the research achievements about agricultural products traceability between China and developed countries and combine with the reality of China to look for solution. Table 1 shows the characteristics of domestic and foreign agricultural products traceability.

From Table 1, we can see that compared with the developed countries, the implementation of agricultural

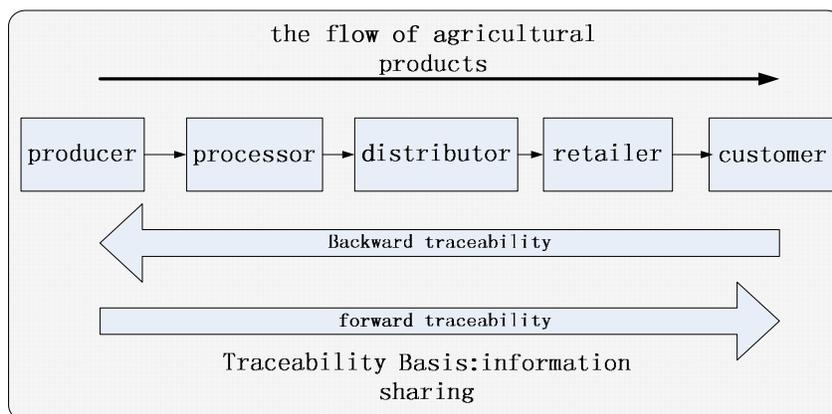


Fig. 1: Agricultural products circulation

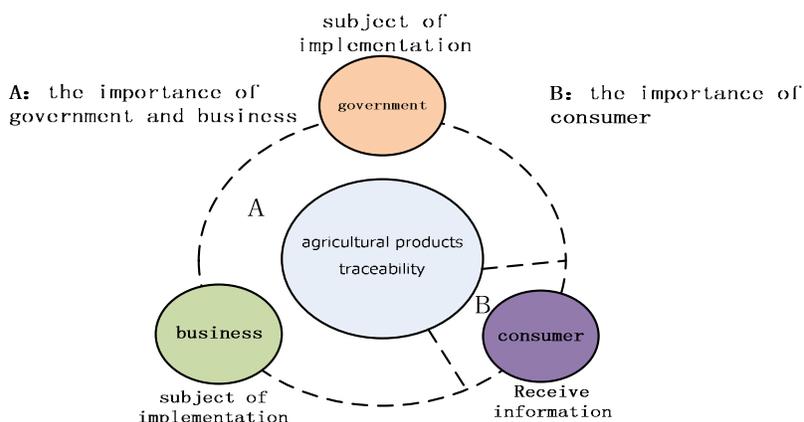


Fig. 2: Importance of different subjects

Table 1: Comparison of agricultural products traceability between China and developed countries

Item	China	Developed country
Object	Few products (simple chain)	Almost all product (scomplex chain)
Information transfer	Simple link, lock of information sharing	Complete information flow, information sharing
Cost	High average cost	Low average cost
Subject	government, business	Government, business, consumer
Market condition	Business rejection, no trust for consumer	Government-Leading, business- spontaneous
Consumer cognition	Low cognition	High cognition
Standard	No unified standard	Unified standard
Link	Single link	Complete links
Feedback	No feedback mechanism	No feedback mechanism
Emergency management	SLOW response, long processing cycle	Quick response, short processing cycle
Credit guarantee	Defective system	Good credit records
Punishment	Slight	Severe

traceability faces many problems in China, but these problems should be solved from easy to difficult. Some researchers in China have done some works from the aspects of system construction, business, farmer, driver, information technology, etc. But the importance of consumer is ignored normally in China, so this study mainly focuses on the consumer confidence for further analysis.

Consumer-oriented analysis on traceability:

Successful implementation of agricultural products traceability is based on information sharing and it has come to truth between agricultural enterprise and the government or between agricultural enterprises in China, but the whole traceability lacks of the attention to consumer demand for information control. That is to say, when scholars analyze related traceability system, they regard the terminal consumer as only information receiver instead of taking the driven function of consumer into consideration (Verbeke *et al.*, 2007). In particular, at present the agricultural products market lacks of confidence badly form consumers in china. Therefore, the role of consumers can not be ignored. Figure 2 shows the importance of different subjects. For different subjects, the implementation purposes of the traceability system are different. The main participation objects in traceability system involve government, enterprises and consumers. Government departments aim to perform supervision responsibility. The enterprise gains competitiveness through improving product differentiation while ensuring the quality of products. Consumers in general are simply to obtain food safety information.

From consumer's point, the main reasons agricultural product traceability is hard to implemented are as follows:

- Lack of cognitive for agricultural products in traceability market. Only specific area or specific group have better understanding of agricultural products traceability and know the effects and the significance of traceability, on other side, little publicity can not help residents get more information. Thus, increased price will affect the consumer purchase behavior with further result of

lowing enterprise's enthusiasm (Zhao *et al.*, 2010).

- Consumers in China always doubt about authenticity of the traceability label information. This is due to frequent food safety accidents of Chinese well-known agricultural enterprises in recent years, large scope of fraud and false advertising used to make benefits. These phenomenon's all affect behaviors of consumers.
- In china, most of the agricultural products retail markets are pedlars' markets, in which consumers like to choose products cheap and fine and most products have kinds of substitutes. on the opposite, consumer's choice is limited in supermarket. As a result, this retail mode will influence the consumers to buy agricultural products with traceability.

RESULTS AND DISCUSSION

Based on the actual situation in China, this pape puts forward some development proposals focusing on consumer.

- With the development of economy in China and increase of living standards of urban residents, consumers are more likely to buy higher safe agricultural products, but it is common for consumers to have skepticism on those with safety label. And in addition, the perception of products traceability is not very deep. But now it is easy to get safety information by scanning the QR codes and this method is the most common and convenient one for consumer. So we can make use of popularity of phone to extend its functions. That is to say we can provide extra information services that consumer is interested in except the original traceability to strengthen the willingness to buy products with traceability. This is a good way to form consumption habit but the premise is that the information is reliable. The main extra service is: provide food collocation, nutrition constituent and recipes information for consumer.
- Establish certain consumer feedback mechanism. Consumer can compare received safety information with the actual result and feedback his comment to

promote the improvement of the agricultural products traceability chain. Because of information asymmetry, enterprises and government as the holder of the agricultural product safety information, is not able to make effective commitment for consumers and consumers can only obtain agricultural product safety information without playing the role of supervision for the safety of agricultural products. This phenomenon will lead to "complete check" after major food safety incidents. For government and enterprises, they can make random check on comments for improving the regulatory quality and efficiency. For consumers, it can enhance the participation themselves of agricultural products traceability and gain more confidence from agricultural enterprises. The final result is the dramatic increasing of the consumption of agricultural products.

- Because the final receiver of agricultural products is consumer and it is commonly existed that consumer lost confidence in food safety information in China, which is caused by many aspects. Therefore, it is necessary to strengthen cognitive confidence of consumer in enterprises etc. one of the important measures is to credit guarantee system for enterprises to ensure the truthfulness of the information. To establish food safety credit information platform and collect and publish identity information of food producer, tip information, warning information and good information unifily. Each related department will put the food permission, routine monitoring and illegal behavior information into the credit files and determine management emphasis and frequency according to the credit status of the food producers. Also it helps to low the cost of supervision.
- To enhance consumer confidence should not be the only responsibility for enterprise and it is more important to make positive information of government play a role in the traceability. Therefore, to take certain measures to promote the acceptance of traceability should be considered when establishing system the agricultural products traceability in China. The public traceability platform is a good proposal. In addition, in the presence of food safety problems, the government can do quick response with the principle of responsibility and severe punishment, because food safety is public utilities related to residents' physical and mental health. Under the help of government, it is effective to rebuild the credibility of enterprises in the agricultural products traceability.

CONCLUSION

We find some difficulties of the implementation of agricultural products in China through the study of

agricultural products traceability of China and developed countries. And this study mainly analyzes the reason block the implementation of the agricultural products traceability in the aspect of consumer who play a important role in it. Finally put forward the development suggestions of providing extra services, building feedback mechanism, creating credit guarantee system and government-leading to promont implementation of traceability. Because the agricultural products traceability is a complex project and reality in China is very complicated, it is necessary to carry out copenhensive analysis not only one aspect. And that is the further research point we focused on.

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