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Implementation and Current Status of Food Traceability System in Jiangsu China

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Abstract

Food security is an essential aspect of common health. It is important to trace the source of food and its components so that the potential risk can be detected and the responsibility can be lied when the damage happens. However, considering the complexity of food production and consumption, it is a great challenge to build the traceability system. Jiangsu, one of the most developed providences in China, has developed a food traceability system that covers the major food production and supply companies. In this paper, we will introduce the structure of the existing platform and current status of the food traceability situation in Jiangsu Province. Also the problems and potential improvements are discussed.

Keywords: Traceability analysis; Food security, Data management;

1. Introduction

With the accelerated process of economic globalization, food safety is not only related to the health of consumers, but also an important pillar of social and economic development of harmony and stability. It is required to identify, prevent, control and reduce the food risks from the farm to the table, where whole process may exist in a variety of hazards. To minimize food safety risks, it is necessary to trace the source of hazards, tracking the flow of food products involved. The tracing model based on the tracking mark is dependent on the process model of the specific product type, so that the retroactive information system based on the modeling method cannot be used for other kinds of food and its process leading to the lack of system compatibility, and form a large number of information islands. This situation hinders the reproducibility of retrospective information system and its interconnection, it is difficult to form a complete food information chain; and the current food safety process risk assessment model ignores the various factors in the process of food production and circulation,

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even though the complete Retrospective information also does not identify the risk factors that are harmful. Therefore it is difficult to implement effective risk management to assess and reduces the impact of risk factors without food traceability system.

In 2016, FDAC (Food and Drug Administration China) started a national research project to establish a prototype system for food traceability analysis in China. This project covers the researchers from academic, industry and government administrations. As one of the most developed provinces of China, Jiangsu joined the project as the test area to demonstrate the effectiveness of food traceability system. In this paper, we will give a full description of the system framework and the current status after near one year experimental online operation.

The rest of the paper is structured as follows. Section 2 supplies the related work about traceability systems. Then the framework and implementation of Jiangsu Food traceability system are described in Section 3. In Section 4, we summarize the current operation situation of the traceability and a comprehensive discussion is given. Finally, the whole paper is summarized in Section 5.

2. Related work

In 2002, EU Food Safety Authority was established, then traceability system is proposed for food, feed and raw materials. It covers production, processing, storage and transportation of the entire industry chain. In July 2013, the United States set up the "Global Food Traceability Center" to focus on the integration and unity of enterprises, government, academia, foundations, consumers and other forces together to promote traceability in food supply Chain system cooperation and the implementation of a complete chain of agricultural products.

In academic fields, traceability is also studied intensively. Yang et al. (2009) developed the web-based pork quality traceability platform using animal identification technology, PDA intelligent reading technology, GPRS technology, Intranet and Internet technology, combined with China's "livestock and poultry identification and culture file management approach". This system implement the tracking and reverse the traceability from the source of production to the consumer terminal. Chen Changxi et al. (2010) developed a traceability platform for production monitoring and product quality of broiler industry, which covers the production system of broiler production and slaughter and processing, taking into account the interests of enterprises, governments and consumers. Zhu et al. (2011) introduced the project called "Agent-based agricultural product quality control method research" that carried out Agent technology, international common coding technology and database technology to traceability system research. Liang Kun (2012) used traceable particles as the carrier of cereal information, and prints its surface into two-dimensional bar codes of cereal origin information, and this method is used to collect object identification. It can effectively connect the information flow with the real stream, and realize the low cost, fast and effective identification of the grain origin information in all aspects of the food production supply chain. Qian et al. (2013) developed a RFID-based vegetable quality traceability system. However, most of the existing traceability researches are focus on certain type of food instead of overall food industry. In this paper, we will give a detailed introduction of the food traceability for a province which has nearly 80 million population and 1 trillion USD GDP.

3. System Framework

Jiangsu province is a large province of food production and a well-developed province. The food production enterprises in Jiangsu province are more than 10,000, and there are over 471,900 households have a food circulation license. The food and beverage service units is up to 22 million. Also, there are a large number of small business and shops in the food industry, therefore food safety supervision on such number of unites cannot effectively implemented by the traditional technologies.

To deal that, we design an updated system to collect, storage and analysis the food traceability data. The system framework is shown as follows: