

Application of Chemical Detection Technology in Food Safety Detection

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Abstract: With the rapid development of society and economy, people's living standards are constantly improving. More and more consumers begin to pay attention to the nutrition and safety of food, especially the demand of agricultural products in China is increasing. In order to ensure the safety of food, it is necessary to strengthen the optimization activities of food detection technology. According to the specific situation of food safety detection in China, this paper puts forward the main reasons of food safety problems, analyzes the application of chemical detection technology in food safety detection, and formulates measures to strengthen food safety detection level.

1. Introduction

At present, the number of food safety accidents in China is rising, and more and more people begin to pay attention to food safety problems. In view of this, the government attaches great importance to food safety supervision means, and strengthens the optimization activities of relevant measures. Through multiple food detection technologies, the safety performance of food is enhanced. The application of chemical detection technology in food safety detection can effectively promote the development of food detection.

2. Main Causes of Food Safety Problems

2.1. Food Safety Problems Caused by Pesticide Residues

China's land area is relatively large, with a variety of agricultural products. In order to effectively reduce the occurrence of diseases and pests, improve the growth rate of crops, pesticides and chemical fertilizers are bound to be used in agricultural planting activities. Although the application of pesticides and chemical fertilizers can reduce the damage of diseases and pests on crops, improve the maturity speed of crops, once overused, there will be too many pesticide residues in agricultural products, which will easily lead to food safety problems. At present, China is vigorously promoting and implementing green agricultural technology, which has controlled chemical residues to a certain extent, but it still needs to attach great importance to the problem of pesticide residues.

2.2. Food Safety Problems Caused by Excessive Additives

To meet people's needs for food quality, appropriate amount of food additives will be added in food processing activities, which will not affect human health. However, many illegal businesses ignore the health of consumers and apply excessive additives to food processing. Some food additives will threaten human health, and even affect the stable development of society.

2.3. Food Safety Problems Caused by Microbial Contamination

Microbial pollution mainly refers to the food pollution caused by the erosion of harmful microorganisms. The food production environment of some manufacturers can't meet the requirements and regulations of national standards. In the process of production, storage, processing and sales of food, some microorganisms will pollute the food. Once the food is contaminated, it will deteriorate. After eating the food, consumers will have poisoning symptoms, directly threatening

their life and health.

3. Analysis on Application of Chemical Detection Technology in Food Safety Detection

3.1. Application of Chromatographic Detection Technology

3.1.1. Gas Chromatography

In the gas chromatography detection method, the development of related detection work mainly uses chromatograph and other professional equipment, which was born in the mid-20th century with very high effectiveness. With the rapid development of science and technology, gas chromatography has changed and been widely used in food safety detection. In the process of detecting pesticide residues and pollutants in agricultural products, gas chromatography is usually used. In this method, the number of test samples needed is relatively small, and the pesticide pollutants can be separated in a short time. The analysis activities of this method spend less time and have a certain analysis efficiency. At present, gas chromatography plays an important role in food safety detection. With the continuous improvement of detection technology, the detection types of pollutants will increase and the detection scope will expand rapidly.

3.1.2. High Resolution Liquid Chromatography

High resolution liquid chromatography plays an important role in many aspects of chromatography. In high resolution liquid chromatography, the solution will enter the chromatographic column through the high-pressure infusion pump, and the sample will be injected into the container through the chromatographic column, so that the food quality detection will be realized. In this method, gas chromatography is the basic one, which not only has various functions, but also has outstanding accuracy. High resolution liquid chromatography has outstanding detection efficiency and sensitivity, which can be applied to the detection of a variety of items, and can complete the relevant analysis activities in a short time. Therefore, the technology has a very wide range of applications in food safety detection.

3.2. Application of Biological Detection Technology

3.2.1. Immune Technology

In the process of carrying out toxic food detection activities, immune technology is usually chosen. As for the generation of food toxins, the important reason is that the production and preservation of food are not carried out in accordance with the requirements and regulations of relevant norms. Once these foods are consumed, they will have adverse effects on people's health. In food toxin detection activities, the safety of food can be guaranteed through immune technology. In food, the common toxic substances are aspergillus, synthetic mycins and so on. Based on the principle of antibody and antigen, immune technology can carefully observe the changes of harmful substances and ensure the smooth implementation of detection activities.

3.2.2. DNA Probe Technology

Among many food safety detection technologies, DNA probe technology is relatively advanced, which can significantly improve the accuracy of detection results. In molecular fragments, if there are isotope markers, it is very difficult for testers to make clear the specifications of the fragments. For unlabeled single stranded DNA probes, they can be linked to promote the generation of molecular markers, and carry out matching activities through the basic role of complementary bases.

3.3. Application of Spectrum Detection Technology

3.3.1. Fluorescence Analysis

Fluorescence analysis belongs to the category of new analytical technology, which has a very prominent sensitivity, and has a very wide range of applications in food detection activities. Based

on the working principle of this method, the analysis activities can be divided into two types, namely, molecular fluorescence analysis and atomic fluorescence analysis. The most significant difference between them is the spectrum. In the molecular fluorescence analysis, the related analysis work is mainly based on the molecular fluorescence spectrum. In atomic fluorescence analysis, the analysis activities are mainly based on atomic fluorescence spectrum. In the detection of harmful substances in food, the technology is widely used.

3.3.2. Plasma Emission Spectrometry

In the process of carrying out quantitative element detection activities, the relevant work is mainly completed by plasma emission spectrometry detection technology. In the multi-element detection and analysis activities, the plasma emission spectrometry detection technology plays a key role, which can effectively promote the completion of single element analysis, and the technology has a very prominent accuracy. The food detection activities, especially the detection activities of nutrition and health products and pollutants, mainly rely on the plasma emission spectrometry.

3.3.3. Near Infrared Spectroscopy Technology

In the food processing safety and quality detection activities, near infrared spectroscopy technology has a wide range of applications. The technology is relatively simple and fast, can complete the detection activities in a short time, and will not generate pollutants in the whole process. In terms of detection accuracy, compared with other detection technologies, near infrared spectroscopy technology has outstanding accuracy. With the rapid development of science and technology, near infrared spectroscopy technology has also made some achievements. In the current liquid food inspection activities, near infrared spectroscopy technology plays an important role. In this technology, there are mainly two detection methods, namely infrared spectroscopy technology and off-line detection technology.

4. Strengthening Measures of Food Safety Testing Level

4.1. Ensure the Rationality of Detection Technology Application

The food safety testing activities have a certain correlation with many contents. The testing activities are complicated, including many types, and many factors will affect the safety performance of food. Therefore, when using relevant chemical technology, in terms of the selection and application of food safety detection and analysis technology, detection personnel should base on the chemical composition of food, carry out relevant selection activities scientifically, ensure the effectiveness of the selected technology, and then promote the detection results to be guaranteed. In addition, in the work of food safety testing, testing instruments and equipment play a vital role. Food safety testing institutions should regularly organize the inspection and maintenance activities of experimental instruments and equipment, and vigorously introduce advanced instruments and equipment.

4.2. Establish and Improve Food Safety Production Responsibility System

In the process of carrying out food safety testing activities, the effective implementation of food safety production responsibility system can strengthen the sense of responsibility of relevant staff and help them carry out serious testing activities in all food production links. In order to ensure the standardization of food safety testing, relevant departments should formulate food safety production responsibility system, and constantly improve the enterprise according to the specific situation. In the implementation of food safety production responsibility system, the management scope and work content of staff should be further determined, and scientific and reasonable detection methods should be used to ensure the smooth development of food safety detection activities. Once there are food safety problems, the relevant departments should quickly take measures to find out the person in charge at the first time, and seriously deal with them according to the relevant provisions of the food safety production responsibility system, so as to play a good warning role for other employees and improve the effectiveness of food safety management.

5. Conclusion

Food safety is closely related to people's life and health and national economic development. In the process of food safety testing activities, we should reflect the important role of chemical detection technology, and carry out in-depth research and analysis activities, so as to improve the level of food safety testing, provide safer food to consumers, and accelerate the development and progress of food economy.

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