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CURRENT STATE OF ADVANCEMENTS IN RAPID DETECTION TECHNOLOGY FOR PATHOGENIC BACTERIA IN FOOD

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Abstract: In the new stage of food in my country, from the perspective of the development and current situation of rapid detection technology of pathogenic bacteria, this article systematically introduces the technology and methods of rapid detection of pathogenic bacteria, including the use of molecular biology, immunology and biochemistry. technical means. In recent years, my country has entered a new stage in the food field. Research on rapid detection of pathogenic bacteria has introduced genetic manipulation. These technical means have greatly promoted the development of rapid detection technology for pathogenic bacteria in food in my country's new stage.
Keywords: New stage; Pathogenic bacteria; Rapid detection technology; Microorganisms

1 RAPID DETECTION TECHNOLOGY BASED ON BIOCHEMICAL MEANS

In recent years, our country has been developing at a rapid pace in science and technology. Therefore, people have also had higher and higher requirements for civilization, especially food issues and the hazards of pathogenic microorganisms that are closely related to human life and health. Since the 21st century, in the new stage of food problems, rapid detection technology of pathogenic bacteria has also been further developed, and there is enough confidence to detect a small amount (10-18 ~ 10-21) of microbial antigens in clinical specimens. In the new stage of food, there are already new detection technologies, namely the detection technology of bacterial metabolites in biochemistry and rapid proprietary enzyme reactions; in addition, polymerase chain reaction (Polymerase chain reaction) and nucleic acid probe (Nuclear acid probe) detection technology has also been formed in biology[1]. The reason why this technology has become a new product of the biotechnology revolution that has attracted worldwide attention is mainly because this technology has the advantages of fast, simple, specific and sensitive, and has not been used in food. used in the detection of source pathogenic bacteria. The traditional detection methods are simple bacterial culture, isolation and biochemical reactions, which are far from satisfactory for various epidemiological studies and diagnosis of pathogenic microorganisms. This article only introduces the development and current status of rapid detection technology for pathogenic bacteria in food at the new stage [2-3].

1.1 Conventional Detection Technology of Pathogenic Microorganisms

The chemical composition of pathogens is always different, and the metabolites produced are also different. This phenomenon has been well known. When detecting and identifying bacterial types, the different compositions and physiological characteristics of microorganisms, especially bacteria, can be used. One characteristic. Biochemical identification is the most commonly used method for detecting bacteria. Microbiological diagnosis is developing in the direction of micro-quantification and automation. After so many years of continuous research and improvement, a series of kit products have developed into complete sets of supplies, replacing the traditional reagents prepared by each testing department. There are still slow The tedious and cumbersome manual operations are gradually replaced.

1.2 Detection Technology of Microbial Proprietary Enzyme Rapid Reaction System

In the process of bacterial production and reproduction, certain specific enzymes can be synthesized or released by them, and then according to the characteristics of the enzymes, corresponding indicators and substrates are selected and configured in the relevant culture medium. After the bacteria are reflected, the suspicious strains to be isolated and determined can be separated based on their significant color changes. This detection result greatly shortens the rapid detection time of bacteria. The advantages of this technology organically combine biochemical reactions with traditional bacterial separation, making monitoring results more intuitive, and gradually becoming the main trend leading microbial detection.

2 RAPID DETECTION TECHNOLOGY BASED ON IMMUNOLOGICAL METHODS

2.1 Immunofluorescence Technology

Immunofluorescence technology (immunof1uorescence Technique) is an immunological labeling technology that uses fluorescein to detect antibodies or label antigens. Immunofluorescence technology is also called fluorescent antibody technology. The fluorescein-labeled antibodies used in this process are generally called fluorescent antibodies. During the preparation process, fluorescein (commonly used isothiocyanate fluorescent yellow, F1TC) is covalently combined with chemical methods and has high potency and activity. Stronger antibodies. In practical applications, direct and indirect methods are the main methods of immunofluorescence technology. Fluorescently labeled antiserum is added dropwise to the test sample, and it must be washed when observing the results under a microscope. This is the direct method. The indirect method is to drop an antibody with known bacterial specificity onto the test sample, wait for it to act, then wash it, and then add a fluorescently labeled second antibody.

2.2 Enzyme Immunoassay Technology

Enzyme immunoassay (EIA) is divided into two types: heterogeneous and homogeneous, depending on whether the antigen needs to be free and separated from the bound enzyme label during the reaction. The more commonly used method is the heterogeneous phase method, including solid-phase immunoassay and liquid-phase immunoassay. ELISA technology is a representative of solid-phase immunoassay. ELISA technology has corresponding
When detecting an antigen or antibody, the reagent used is to adsorb the antibody or antigen to a solid-phase carrier. When adding an enzyme-labeled antigen or antibody, you must operate according to the reaction principle, and then wash and remove the unbound substances, and then add the enzyme substrate. The substrate will generate colored color due to the catalysis of the British enzyme. The product, and the amount of the product can be judged based on the depth of the reaction color, and the amount of the test substance in the specimen can be measured.

3 RESEARCH PROGRESS OF GENETIC MANIPULATION TECHNOLOGY IN RAPID DETECTION OF PATHOGENIC BACTERIA IN FOOD AT THE NEW STAGE

At this stage in our country, molecular chemistry, biochemistry and microbiology are developing at a rapid rate. The general examination of the external morphological structure and physiological characteristics of food pathogenic bacteria has obviously fallen behind. The identification of pathogenic microorganisms has developed from research on the biological level to the study of biological macromolecules, especially the structure of nucleic acids. and the study of its components. Numerous detection technologies are built on this basis. These advanced detection technologies have become the trend of rapid detection technologies for pathogenic bacteria in food in my country's new stage [4-5].

4 CONCLUSION

The traditional technology of isolating and cultivating bacteria has become a burden for laboratories and cannot bring significant results. The rapid detection method is not only a reform of inspection work, but also brings considerable social benefits. Benefits, such as food inventory costs and issues such as contamination can be resolved quickly to a large extent. But we should be clear that having this new type of rapid detection technology does not mean abandoning the traditional isolation and culture method. In some special cases, the traditional method is still effective. However, according to the current stage of food development, rapid detection technology of pathogenic bacteria still has great development prospects.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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