

Microbiological testing of food and its quality control

Wang Xinrong

Shangzhi Inspection and Testing Center, Shangzhi, Heilongjiang 150601

Abstract:

As the problem of food safety is becoming more and more serious, people's attention to food safety is also increasing, food microbiological testing is an important link to ensure food safety. It plays an important role in the overall safety management of food and the daily supervision of government departments and is a control line of defense for food safety. This paper summarizes the main content of food microbiological testing and food microbiological testing quality control measures, in order to provide reference for the daily food microbiological testing and supervision.

Keywords:

Food; microbiological testing; quality control

1 Methods of microbiological testing of food

1.1 Antibody test method

In the process of food microbiological testing, there are many methods for detecting the microbial content of food, and all of these methods provide great help for food microbiological testing, making food microbiological testing more perfect and food safety more secure. The antibody test is a very basic detection method, mainly on the microbes inside the relevant antibodies, so that its composition through the color display, through the color comparison analysis of the test results, so as to clarify the internal microorganisms in the food is in line with the relevant standards, whether the microbial content of food standards. The antibody test method for food microbiological testing, to improve the success rate of the test, so that food microbiological testing meets the relevant requirements, and planning and adjustment of the relevant food production process.

1.2 Immunological counting methods

Immunological enumeration is also one of the very important tools. The immunological counting method can test for microorganisms such as salmonella in food products, thus improving the safety of food products. Immunological enumeration has many advantages that make it more suitable for food hygiene testing than other methods. The process of immunological enumeration is very simple and accurate, but there are still many problems such as difficulty in controlling the process. So the choice of this method depends on the level of microorganisms inside the food and the requirement of people for food measurement.

2 Quality control in food microbiological testing

2.1 Emphasis on external quality control

By participating in laboratory proficiency testing organized and operated by an accreditation body or its authorized/recognized body and evaluated in accordance with pre-established guidelines, external measures can be complemented with internal quality control, and laboratory competence can be effectively monitored and judged. Inter-laboratory comparison is the measurement or testing of the same or similar items by two or more laboratories under pre-specified conditions. By participating in inter-laboratory comparison and proficiency testing activities, statistical analysis of data, objective evaluation of experimental results, finding their own problems, identifying gaps and shortcomings, putting forward the problem and rectification, continuous improvement of the laboratory quality management system, and ultimately improve the testing capacity to achieve the purpose of quality control, and the higher the level of laboratory proficiency testing activities, the stronger the reliability of

the quality standards, the more information, and the situation will be obtained. The higher the level of laboratory proficiency testing activities, the greater the reliability of its quality standards, and the more comprehensive the information and situation obtained.

2.2 Emphasizing the quality control of testing instruments

In the microbiology testing room, the instruments should be placed in a fixed location, and a person should be responsible for the cleanliness and management of these instruments. Instruments should be clearly labeled and their status should be noted. Records should be kept when instruments are purchased, used, or cleaned in the testing room. Detection of microorganisms should be related to the relevant departments of the process of testing equipment operation, commissioning, maintenance, scrapping, and other processes, to develop more comprehensive regulations. At the same time, in the installation, debugging, overhaul of the instrument, etc., should be well registered.

2.3 Attention to Microbiological Testing Process Quality Control

In order to further improve the food microbiological testing work, not only need to continue to innovate technology and improve the quality of personnel but also need to further improve the relevant regulatory system, and strengthen supervision and management control. There are many loopholes in the process of food microbiological testing, for example, whether the staff can use the relevant technology in a timely manner for testing whether related equipment and technology are used properly, and whether the staff have cut corners in the behavior. These situations have a great impact on the test work, resulting in the whole food microbiological testing work being difficult to carry out. The entire microbiological testing process, starting from sampling to the issuance of test results report, which the operational requirements and methods should have clear provisions, but also the flow of reagents and samples should be recorded. Microbiological test samples collected must represent all parts of the food, in order to obtain accurate test results with value, should be based on the specific circumstances of the development of the corresponding sampling program to avoid sampling being subjective and random, the number of samples should meet the test, retesting and other needs, and to ensure that the representativeness of the samples and the integrity of the transport. Collected food microbiological test samples should be delivered in a timely manner while minimizing the collection to the test process time. When the samples are sent to the laboratory should be sent to the test requirements one by one check the test items, attention should be paid to maintaining the conformity of the state of the samples; check the name, origin (manufacturer), batch number, expiration date, approval number, specifications, package style, storage and transportation conditions, quantity, etc., and the receipt of the samples to prepare a unique identification [1]. The original records and experimental records of the inspection process need to be faithfully recorded on the conditions and methods of the experimental process operation. Therefore, it is necessary to supervise the relevant quality supervision and control system to ensure that the test results meet the relevant requirements so that the decision-making process is more scientific and rationalized to ensure the safety of food.

2.4 Internal quality control

2.4.1 Quality control of laboratory environment and Equipment

Food microbiology laboratories should comply with the experimental procedures, strictly distinguish between office areas and operational areas, control the areas that affect the quality of analysis and testing, limit the access to or use of the above areas, and effectively segregate the adjacent areas of incompatible activities [2]. Washing, incubation, sterilization, and aseptic operations should be separated and conducted in separate rooms with completely separate laboratory facilities. Avoid contamination of the environment, which could result in false-positive or false-negative results or reduced sensitivity of the assay.

2.4.2 Quality control of the testing environment

Food microbiological testing is mainly carried out in the form of experiments, therefore, while ensuring the overall hygiene and safety of the laboratory, it is also necessary to remove potential contamination factors in the laboratory to avoid contamination of experimental samples. In addition, after the completion of food microbiological testing, the staff should do a good job in the harmless treatment of culture media and waste, especially in the specific testing process, and must strictly abide by the aseptic testing procedures to improve the scientific nature of the testing process. This is to ensure that the quality of the test is effectively controlled.

2.4.3 Quality of Inspectors

Microbiology testing personnel will affect the entire testing process and the accuracy of the test data, test personnel is to measure the quality of microbiological testing work is one of the main factors [4]. Inspection personnel should have a high degree of responsibility and rigorous work attitude, at the same time must have received a microbiological testing of special basic education, familiar with the testing procedures, mastery of testing methods, and has a wealth of professional knowledge and corresponding operational technical skills and analytical judgment; should be regularly organized training and further study of inspection personnel, and actively participate in the inspection and testing technology exchange meetings, learning new technologies for microbiological testing of food products at home and abroad New methods, discuss the problems encountered in the testing process, enhance the professional skills of inspection staff, and constantly improve the laboratory testing level to adapt to the increasing testing requirements; staff need to pay attention to personal hygiene, the need for diligent bathing, diligent nail clipping, do not leave long hair, diligent change of clothes, etc., and at the same time, to the inspection staff to participate in the training and assessment of the records.

2.5 Attention to the rational choice of testing methods

Due to the different types of microorganisms, the microbial detection methods chosen are also different, so as to enhance the accuracy of the test results. Therefore, in the specific detection process, the staff should first do a good job in the detailed inspection of biological samples, according to the unique nature of microorganisms to choose the best test method, and then comprehensively improve the scientific nature of the test work. In addition, the inspectors cannot rely on their own experience, and change the test method at will, once the test method is determined, cannot be easily changed, otherwise it will seriously affect the test results. From the perspective of microbiological testing methods, China has promulgated many laws, regulations, and standards for the entire testing process to provide a basic legal basis. Each food inspection department should carry out microbiological testing according to the relevant standards to effectively control the quality of testing.

Conclusion

Food safety as a basic livelihood issue directly affects the development of society, food microbiological testing in food safety inspection and testing is crucial. The traditional methods of food microbial identification mainly include morphological structure, cell culture, biochemical test, serologic typing, phage typing, toxicity test, and serum in vitro coagulation test. However, in the context of continuous social and technological advances, especially in recent years, the more popular gene chip technology, etc., may fundamentally change the means of microbial detection. Some new tests will emerge, and food microbiological testing will continue to develop in the direction of high standards, efficiency, precision, and sensitivity. This aspect of the test quality control should be carried out from various aspects, including the design of the laboratory, the main instrumentation, laboratory cleaning, quality control of inspectors, reagents and media and standard strains of bacteria control, control of testing instruments and experimental process design, etc., in this part of the link inside, each link interacts with each other, and therefore requires to ensure that the quality of each link in order to make the measurement results become more accurate. higher accuracy of the measurement results.

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