Application of Enzyme Technology in Food Processing and Testing

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Abstract: The enzyme itself is a catalyst, which can undergo hydrolysis reaction, oxidation reaction and synthesis reaction, and the safety and reaction efficiency of enzyme technology are relatively high. The effective application of enzyme technology in food processing and food testing can improve processing efficiency and testing efficiency. Research and analyze the specific application of enzyme technology in food processing and testing, and explore the application value of enzyme technology. It can promote the further development of enzyme technology and has a positive significance for promoting the long-term healthy development of my country's food processing industry.

1. Introduction
Enzyme technology itself is the main component of biotechnology, and it has a strong application effect in food processing and food testing. In the process of continuous improvement of my country's scientific and technological level, the development speed of biotechnology is relatively fast, therefore, the enzyme preparation research has achieved certain success. These have laid a good technical support for promoting the wide application of enzyme technology in food processing and food testing. The macromolecules with catalytic activity of enzymes generally exist in the form of proteins. Compared with other catalysts, the reaction efficiency of enzymes is relatively high, the reaction conditions required are relatively mild, and fewer by-products are generated. The application of enzyme technology in the process of food processing can improve the efficiency of food processing and ensure the quality of food processing.

2. Overview of Enzyme Technology
Enzyme technology mainly refers to the catalysis formed by using microorganisms to produce enzymes or adding enzymes directly in a specific reaction vessel. The catalytic effect produced by enzymes can promote the conversion of components and is a processing technology commonly used in the food processing industry. Adding enzymes during food processing can reduce the reaction activation energy in food processing, and can increase the reaction rate and improve the overall efficiency of the reaction. Because the enzyme itself will not be consumed in the reaction process, it will not affect the chemical balance in the food processing process. The temperature requirement of the enzyme technology in the reaction process is relatively low, and it can be completed only at room temperature or warming. Reaction can reduce the adverse effects of temperature on food nutrition. The enzymes used in food processing are mainly produced by edible organisms and safe organisms, which can ensure the safety and quality of food. The full application of enzyme technology in the food processing process can promote the development of the food processing industry in the direction of safety, energy saving and environmental protection [1].
3. Application of Enzyme Technology in Food Processing

3.1 Application in Meat Food Processing
While people's quality of life has improved, people's pursuit of meat products has also increased. In the development process of meat products, people tend to use some meat products with relatively low salt and fat content, and some by-products will appear in the meat processing process. In order to improve the economic benefits of meat processing, by-products can be fully utilized to prevent waste of resources. During meat processing, enzyme technology can be used to monitor the processing technology in real time to ensure the production efficiency and flavor of meat products and reduce the possibility of harmful substances being generated during processing.

In the processing of meat food, the meat itself contains endogenous enzymes, but the endogenous enzymes cannot fully function. Generally, the use of exogenous enzymes is required to complete the meat food processing. The types of exogenous enzymes mainly include oxidase, reductase, transferase and hydrolase. Exogenous enzymes can promote protein hydrolysis and cross-linking reactions. Hydrolyzing proteins during meat food processing can increase the freshness and tenderness of meat products, and can increase the active peptide substances in meat foods to achieve the purpose of enhancing the flavor of meat products. The use of protein cross-linking treatment can improve the water retention performance of meat and enhance the gel strength of meat food. It is generally used in the production of specific meat products. In the processing of meat products in my country, the proportion of fish products processing is relatively large, but the utilization efficiency of fish products in my country is relatively low, which will lead to a reduction in the additional economic benefits of fish products. And the deep processing technology of fish products is not perfect, which will affect the further development of the fish product processing industry. Enzyme technology is fully applied in the processing of fish products, which can improve the water solubility, emulsification and rheology of fish protein, and can use enzyme hydrolysis treatment technology to produce more amino acids and improve the nutritional value of fish products. For example, when hydrolyzing grass carp protein, alkaline protease can be used to obtain fish products with relatively complete amino acid substances. In addition, when processing seafood, seafood itself contains different allergens. Enzyme technology can be used to remove the allergenicity of seafood products, improve the taste of seafood, and improve the processing quality of seafood products [2].

3.2 Application in the Processing of Fruits and Vegetables
Fruit and vegetable processing is an important part of the food processing industry. In general, fruit and vegetable processing is the process of processing fruit and vegetables into fruit juice or vegetable juice. When processing juice, it is necessary to release pectin-like substances with relatively high viscosity in the pores of food cells. This will affect the filtration and clarification quality of juice to a certain extent. And the use of enzyme technology to complete the juice processing process can use pectinase to directly decompose the pectin in the juice, reduce the viscosity of the juice, increase the juice extraction, and improve the clarification efficiency and quality.

In the processing of fruits and vegetables, the fruits used may have under-ripe fruits. These fruits have a lot of starch. If enzyme technology is not used for juice production, the viscosity of the juice will increase, which is difficult to clarify and will seriously affect processing quality of juice. Therefore, it is necessary to apply amylase and pectinase in the processing of vegetables and fruits, which can effectively solve the problem of large viscosity of juice and improve the quality of juice processing. In addition, in the production process of citrus juice, if the traditional production process is used, the acid-alkali method needs to be used to complete the capsular removal process, which will cause waste pollution in the production process and affect the quality of citrus juice. Using enzyme technology, a variety of enzymes such as pectinase and hemicellulase can be applied together, which can improve the removal efficiency of the capsular coating, and can prevent waste from polluting the environment during the production process, and improve the environmental protection of citrus juice processing.
3.3 Application in Grain Food Processing

There are many kinds of cereals in my country. In the process of agricultural production, cereals are the main agricultural products and one of the important raw materials for the food processing industry. The development of cereal processing in food processing is relatively early. With the rapid development of the food processing industry, the economic benefits brought by cereal processing have been rising at a slower rate. Therefore, it is necessary to use enzyme technology to improve the level of grain food processing and ensure the overall economic benefits of the grain processing industry.

In the process of cereal food processing, starch is a relatively large amount of material, and the nutritional value of starch itself is relatively high. In the process of grain processing, it is necessary to use special enzyme technology to carry out deep processing of starch in the grain, in order to achieve starch sugar, starch wine and other processes. In the process of grain food processing, according to the current medical field and nutrition research results, to improve the diversity of enzyme technology in the process of grain processing, the use of enzyme technology can be processed to meet the human nutritional needs of grain food. For example, new cereal foods such as dietary fiber that have been popular in recent years are new cereal foods processed by enzyme processing technology. Dietary fiber foods are rich in nutrients and can effectively improve various physiological functions of the human body. In addition, fiber dietary fiber has relatively low calories and strong water solubility. It can provide the human body with necessary nutrients and reduce the body's intake of fat. It is a healthy and low-fat nutritional food. To process grain into dietary fiber, it is necessary to convert starch with a relatively large molecular weight and a long molecular hinge to make it into a dietary fiber with a relatively small molecular weight and a short molecular hinge. In this step, enzyme technology must be used for processing, and a variety of biological enzymes can be obtained by hydrolyzing the starch molecular chain. The use of enzyme technology to complete dietary fiber processing can improve the efficiency of grain food processing, ensure the quality of food processing, and can improve the economic benefits of grain food processing [3].

4. Application of Enzyme Technology in Food Testing

4.1 Enzyme Biosensor Method

The enzyme biosensor method mainly refers to a method of combining enzymes and electrodes to accurately determine the content of a specific substrate. The enzyme itself has a specific catalytic effect on specific substrates, and the convenience and rapidity of electrochemical analysis are relatively strong, which promotes the combination of the two, and can quickly and selectively determine specific substances in a variety of components. The enzyme biosensor method can be used to quantitatively detect the glucose content in serum during the initial application process. Through continuous research and improvement of the enzyme biosensor method, its application advantages are more obvious. The enzyme sensor method has strong selectivity, the detection speed is relatively fast, and the sensitivity is relatively high. In the continuous development of the enzyme sensor method, its application in the food quality detection process can accurately detect substances in food that threaten human health. For example, to detect the content of nitrite in food, the nitrite reductase biosensor can be used to improve the detection efficiency and ensure the accuracy of the detection results.

4.2 Enzyme Linked Immunoassay

The enzyme-linked immunoassay method is a labeling immunology technique, which was first proposed by scientists in Sweden and the Netherlands in 1971. The operation method of the enzyme-linked immunoassay method is relatively simple and convenient, and it can be quantitatively analyzed, and its application in the food quality detection process is relatively common. For example, pesticide residues in fruits and vegetables can be accurately detected. In addition, using enzyme-labeled hapten to directly compete with enzyme-linked immunosorbent assay can accurately determine the residue of fenvalerate in peaches. At present, in the process of applying the enzyme-linked immunosorbent analysis method, the food detection work is mainly completed by kit
products. The manufacturer of the kit product is different, there will be some differences in the method of use, product quality and test results. Therefore, in the detection process of the sample matrix, it is necessary to make a reasonable selection of the immune kit according to the specific situation. If the sample is found to be positive during the test, liquid chromatography should be used for further testing to ensure the accuracy of the test results. In order to improve the sensitivity of food testing, when researchers study the enzyme-linked immunosorbent analysis method, they combine it with superparamagnetic particles, which can increase the specific surface area and fluidity, reduce the steric hindrance, and can effectively improve the detection. Sensitivity. It should be noted that in order to promote the perfect development of the enzyme-linked immunoassay kit, it is necessary to strengthen the immune reagents and research work, and improve the application level of the enzyme-linked immunoassay method in the food detection process [4].

5. Application Prospects of Enzyme Technology in Food Processing and Food Testing
Enzyme technology is widely used in food processing and food testing, and has achieved good application results. In the process of rapid improvement of science and technology, the development speed of biotechnology and genetic engineering is relatively fast, which provides a solid theoretical support for the innovative development of enzyme technology. During the development and application of the enzymatic technology, its application advantages in food processing and food testing will be more prominent, and the scope of application will be more extensive. It is mainly determined by the following two reasons: on the one hand, with the continuous improvement of people's living standards, people's attention to the safety, quality and nutritional value of food is rising. This provides a good market prospect for the development and application of enzyme technology. Because enzyme technology itself has health and safety effects, the application of enzyme technology in some special food processing processes will be more extensive. It can promote the health and safety development of my country's food processing industry. On the other hand, people's emphasis on food safety and nutritional value will inevitably lead to continuous improvement of food safety monitoring and quality testing standards, which has new requirements for food testing technology. The application of enzyme technology in the process of food testing can improve the efficiency of food testing and ensure the reliability of the test results. This is an important opportunity to promote the promotion of enzyme technology in food testing, and has a positive effect on the further development of enzyme technology.

However, it should be noted that the relatively high application cost in the application of enzyme technology in food processing and food testing is an important factor affecting its promotion. The price of most highly active enzyme products is relatively high, which will cause some food processing plants to abandon the use of enzyme technology in order to save food production costs. Therefore, in the future development of enzyme technology, it is necessary to pay attention to the research on low-cost high-activity enzyme preparations. This is an important content to promote the future promotion and application of enzyme technology, and it is also a key issue that cannot be ignored in the development process of enzyme technology [5].

6. Conclusion
In summary, the full utilization of enzyme technology in the process of food processing and food testing can greatly improve the development level of my country's food processing industry. And with the continuous development and innovation of enzyme technology, its application in food processing is becoming more and more common, and its application cost will be reduced, thereby reducing food processing production costs. At the same time, the health and safety performance of enzyme technology itself can improve the quality of food processing. This has a positive significance for improving the health and safety development of my country's food industry. In addition, in the process of food testing, the further development of enzyme technology can accurately detect the quality and safety issues in food. The detection efficiency is relatively fast, the detection results are highly accurate, and have high application benefits. In order to promote the promotion and application of enzyme technology in food processing and food testing, relevant researchers need to strengthen
research on biotechnology, improve the application level of enzyme technology, give full play to the application advantages of enzyme technology in food processing, and dig deeper into enzymes application potential to meet the application needs of enzyme technology in various industries.

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