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SYNTHESIS OF AMINO ACIDS, PROTEINS, ENZYMES AND OTHER COMPOUNDS IN MICROORGANISMS

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ABSTRACT

Currently, microorganisms are widely used in various industries to obtain various compounds. Since ancient times, mankind has been fed by microorganisms in its daily environment (for example, in yogurt, cheese, baking, vinegar and wine production). In later years, as the laws of development of microorganisms were better studied, it became known that they can synthesize various substances. Because there are many biochemical features of microorganisms and they can be studied in a wide range of ways. For example, protein obtained from microorganisms can easily replace vegetable protein in livestock and poultry farming. in this article, we will consider the biochemistry of microorganisms, that is, the synthesis of amino acids, proteins, vitamins and other compounds in microorganisms.

Keywords: endoenzyme, exoenzyme, corunebacterium acetoacidophilum, gibberellin.

INTRODUCTION

In the food industry, there are opinions that amylolytic enzymes of molds and bacteria replace the amylase enzyme in grain. At present, the issue of using protein from microorganisms in the food industry and for technical purposes is one of the issues that must be resolved. In the near future, micro-organisms will replace plant-based fertilizers. Cellulase enzyme found in the cells of microorganisms can be widely used in various sectors of the economy, and protease enzymes can be widely used in the hydrolysis industry. Amylolytic enzymes are widely used in baking. Amylase enzyme is important for the quality of bread. Amylase obtained from mold fungi has this characteristic, therefore it is widely used. Air is pumped into the nutrient medium for 8-10 hours to multiply yeasts, then the yeast is centrifuged, washed and pressed, and then packaged. Molasses, the product left over from sugar extraction in sugar factories, is the basic nutrient medium for the growth of species. Torula utilis microorganism, which is used as food in livestock breeding, is propagated in the residues of the paper industry.

It is widely used in baking, alcohol and wine production industry.

LITERATURE ANALYSIS AND METHODOLOGY

Even before the discovery of microorganisms, people have been using microbiological processes in yogurt, wine, and baking. Humanity has encountered various diseases and experienced a number of plagues. It is also mentioned in the holy books, and it is recommended to wash, bathe and keep clean those who died due to illness. In ancient times, doctors and natural scientists began to search for the causes of many infectious diseases. For example, in the works of hippocrates (460-377 year), lucretius (95-55 year) and other medical scientists of that time, it was shown that the cause of various infectious diseases is characteristic of living nature. The person who collected the most information about microorganisms was the dutchman Anthony van Levenguk (1632-1723), who started the "morphology" period of the history of microbiology.

DISCUSSION AND RESULTS

Amino acids synthesized in microorganisms. Many microorganisms have the ability to synthesize various physiologically active substances: enzymes, vitamins, amino acids, biological stimulants. microorganisms synthesize various amino acids, including lysine, tryptophan, arginine, threonine, and others. in our country, diaminopimelic acid is obtained from cheap raw material - toluene, from which 70% of lysine amino acid can be obtained. Recently, in many countries, amino acid lysine is taken with microbiological agents. molasses, hydrolyzates, glucose, fructose, sucrose, mannose, maltose, xylose and 169 organic acids (amber, lactic, fumaric, pyruvic acids) are used as a carbon source in concentrations from 2% to 15%. as a source of nitrogen, organic compounds (peptone, casein hydrolyzate, fish meal) or inorganic salts (ammonium salts, urea, amines, etc.) are used. 10-11 tons of molasses are needed to obtain 1 ton of crystalline lysine. At present, 85%, 10% with hydrolysis, and 5% of lysine amino acid can be obtained with microbiological oil. L-arginine is obtained from the mutant mucobacterium corunebacterium glumaticum. These are grown in a nutrient medium containing carbon and nitrogen, and then the amino acid is extracted. Arginine is used in medicine and food industry. Threonine amino acid is obtained from corunebacterium acetoacidophilum or brevibacterium flavum. Aicrococcus glutamine and brevibacterium divricum synthesize glutamic acid, brev.divaricum and brev.pentosoalaninicum alanine amino acid. gibberellin is synthesized from microorganisms gibberella fujicario. currently, about 30 gibberellins are known, the most important of which is gibberellin α1-gibberellic acid. In addition to gibberellins, gibberellin-like substances are also synthesized in the air of microorganisms. These substances are found in bacteria, actinomycetes and other microorganisms.

Enzymes synthesized by microorganisms

Most microorganisms synthesize various enzymes, if these enzymes are inside the cell, they are called endoenzymes, and if they are secreted into the external environment, they are called exoenzymes. Enzymes are important in various industries, including food, wine, alcohol, and brewing industries, in the extraction of organic acids, amino acids, vitamins, antibiotics, and other substances.

The biosynthesis of enzymes is controlled by the genetic code. They can change under the influence of internal and external factors: mutations, ionizing radiation, nutritional conditions and others. Enzymes that have the same catalytic effect and differ in physical and chemical properties are called isoenzymes.

A decrease in the activity of enzymes in the blood was observed when the conditions for the optimal effect of enzymes changed due to various factors (radiation, chemicals, viruses, bacteria, etc.). This feature of it is used in diagnostics. The method of determining the activity of enzymes in mine serum is widely used. With this method, the disease can be detected at the beginning.

Nutrient medium for microorganisms.

As the science of microbiology develops, the methods of growing microorganisms are also improving. Before the era of Louis Pasteur, food was used as a nutrient medium for microorganisms.

Nutrient medium can be divided into 3 groups:

1) ordinary or simple nutrient medium: meat-peptone soup, meat-peptone agar, etc.;

2) specially prepared nutrient medium: whey agar, whey soup, coagulated whey, potatoes, blood agar, blood soup, ascetic soup and ascetic agar, etc. are examples;

3) differential diagnostic nutritional environment. Currently, many foods are produced on land, because it is more convenient to obtain them.

Currently, non-protein foods are widely used to grow microorganisms. Most heterotrophs and pathogenic microbes can grow well in this environment. In the selective nutrient environment, it is possible to isolate aurim species from many different microorganisms in the soil. Vinogradskiu developed the method of selective cultures for the first time and managed to isolate nitrifiers from other groups of microorganisms. Selective nutrient is prepared for a microbe belonging to one species. Other microorganisms do not grow in such a nutrient medium or their development is very slow. An example of such a nutrient medium is the collective nutrient medium of S.N. Vinogradsky, and it is typical for many soil microorganisms .

CONCLUSION

Microorganisms are of great importance in many industries: in baking, brewing, winemaking, as well as in the production of acetone, butyl alcohol, lactic, citric and acetic acids, and several other technically important products, used a lot. It is natural that knowing the fundamentals of the life activity of microorganisms is an important condition for the rational use of technological processes based on the aforementioned industries. Without such knowledge, it is impossible to rationally use microorganisms and process agricultural products with their help and direct them in the right direction. The search for measures against this enemy, which does not seem to be important even in the medicine of microorganisms, has long been considered one of the important and interesting tasks of the science of bacteriology. The achievements in this field are well known: they marked the opening of a new era in medical science and helped to arouse interest in microbiology among many people in society.

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