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AERATION AND MASS TRANSFER UNDER CULTIVATION OF FODDER YEAST

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Aeration and mass transfer environment - the most important conditions for rapid propagation of yeast. Aeration is designed to provide oxygen to the yeast evenly distributed among them and remove carbon dioxide from the environment that inhibits cells activity. Yeast, like other microorganisms, dissolved oxygen required, as is necessary for their life energy resulting from oxidation of their carbon source.

Mass transfer required to access nutrients into the cell and removal of products of its life.

When cultured microorganisms, particularly yeast feed, the process should be carried out in such a manner that the amount of dissolved oxygen and nutrients entering the cell, equal to their consumption. Depends on growth rate and feed physiological properties of yeast.

Feed yeast rich in protein, amino acids, vitamins, trace elements. The most valuable ingredient is protein. Its content in the yeast of the same species and strain, but grown in different environments and in different modes, ranging from 35 to 55%.

The greatest amount of protein contained in feed yeast grown on corn - potato bard. Therefore, the research on the cultivation of fodder yeast as a nutrient medium we used corn - potato bard.

When fed with 1 kg of dry yeast goes further: 0.4 kg of pig meat, poultry 1.5 kg, 5.7 liters of milk, eggs 30-40 pieces. The diet of fur animals yeast substitute up to 35% meat, accelerate their breeding and improve the quality of fur.

The purpose of research - the study of the processes of absorption and mass transfer in growing feed yeast with the use of discrete - pulse input of energy.

Fermentation installation of discrete - pulse energy input is from the bunker with an inner glass and the cooling jacket, rotary pulse - apparatus, wherein the method is implemented discrete - pulse input of energy. The working body of the device is a

rotary - Pulse unit, consisting of two perforated rotors and a stator fixed to the motor shaft, pipeline system (recirculating, air, toilet), shut-off equipment.

One of the main indicators of the mode of operation, rotary pulse - unit is frequency ripple. Established that increasing the frequency of pulsations from 2 to 2.865 kHz reduces processing cycle from 9 to 3.

In order to determine the effect of aeration on the growth of yeast biomass was given a series of experiments on growing grain to feed yeast Bardi solids content of 8.5%. Established that the maximum concentration of yeast (60 g / l) can be obtained only by intensive air flow, not less than 60 liters of air per liter of culture fluid per hour.

The dependence rate of mass transfer of oxygen from the air flow in aeration for different frequency ripple. With increasing frequency ripple to 2.87 kHz to achieve a rate of mass transfer of oxygen equal to 2.1 g / liter · h is achieved by the air flow of 13 l / l of culture fluid per hour. With decreasing frequency ripple increases air flow of 18 l / h l pulsations at the frequency 2.48 kHz and 24 l / h l pulsations at the frequency 2 kHz.

In dilute media, growth of yeast biomass higher than the concentrated, due to greater solubility of oxygen. However, in the case of alcohol Bard culture broth dilution leads to a significant increase in the latter. This in turn leads to both an increase in the unit cost of energy for processing and increasing metal equipment. Dilution bards twice increases the concentration of yeast by 30% (in terms of volume of concentrated bards). Processing of culture fluid in the installation of air at the rate of 60 l / h l gives the same results for the pulsation frequency of 2.87 kHz, which makes it possible to process concentrated bard growth of no less than diluted.

Conclusions

Experimentally that increased frequency ripple to 2.85 kHz reduces the air flow of 4.5 times compared to traditional methods.

Increased frequency of pulsations allows to intensify the process of growing yeast, namely to reduce the duration of the process from 32 to 12 hours.