

Optimizing nitrogen and mineral composition of the highly concentrated mash of raw starch.

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An important problem is the intensification of alcohol production processes and reduce the cost of alcohol. One way to solve it - fermenting wort increased to 30-40 million/sm³ number seeding yeast. But, with the increasing concentration of solids mash growing influence of nitrogen nutrition on reproduction and physiological activity of yeast cells.

For yeast cultivation race used the yeast *Saccharomyces cerevisiae* DO-11 corn mash with a concentration of 20 and 26% solids, amino nitrogen concentration was adjusted by making the wort amino acids glycine and urea.

Found that, increased content of amine and ammonia nitrogen in the must rise to control of the specific rate of reproduction of yeast cells (in 1,4-1,65 times) and the total amount (40-60%). However, the maximum level of amine oxide 35 mg/100sm³ and amine – 0,8 kg/m³, further increasing their concentration did not lead to a significant increase in cell growth.

Analysis of the data showed that most of the yeast collects in making metals zinc, magnesium, cobalt, iron and copper in nanoform at a concentration of 1,2 mg/m³. The highest number of cells (370 and 400 million/cm³, respectively) were observed using nanoparticles of zinc and magnesium.

The use of zinc ions and magnesium in step yeast generation possible to obtain seeding yeast with increased physiological of up to 500m/cm³ and shorten the duration yeast generation to 12 hours.

It is proved that the addition of metal nanoparticles in ionic form and should be carried out cyclically at a ratio of 2-3 cycles of metal, and as much without metals.

Thus, based on the studies identified the optimal concentration of nitrogen and mineral nutrition by culturing yeast to obtain a large number of physiologically active yeast for fermentation of wort of high concentrations.

KEY WORDS: culturing yeast, nitrogen and mineral nutrition