

**TITLE:** NUTRIENTS EFFECT IN THE PHYSIOLOGY OF *PICHIA KUDRIAVZEVII* IN FERMENTATION PROCESS

**AUTHORS:** FREITA, L.A.; TRALLI, L.F.; FREITA, C.M; FERREIRA, A.S.; TEIXEIRA, V.; RIBEIRO, N.N.; NONATO JUNIOR, C.; MENDES, F.Q; MUTTON, M.J.R; MUTTON, M.A.

**INSTITUTION:** FACULDADE DE CIÊNCIAS AGRÁRIAS E VETERINÁRIAS – UNESP, JABOTICABAL, SP (VIA DE ACESSO PROFESSOR PAULO DONATO CASTELANE CASTELLANE S/N - VILA INDUSTRIAL, 14884-900)

**ABSTRACT**

The nutrients contents present in the broth for ethanol production are essential for the fermentation process since they act as activators of the main enzymes that participate directly in this process, allowing consequently an increase in the yields and efficiencies of the fermentation. For their growth and development of the yeast, they require some vitamins, such as thiamine and pantothenic acid, and nutrients such as nitrogen, phosphorus, sulfur, potassium, magnesium, calcium, zinc, manganese, copper, iron, cobalt, iodine, in addition to other elements in minimum quantities. The goals of this work were to evaluate the impact of different nutrients on the physiology of *Pichia kudriavzevii* in the fermentation process. The experiment was installed in the Laboratory of Sugar and Alcohol Technology of the College of Agricultural and Veterinary Sciences/UNESP Jaboticabal-SP. The experimental design was a randomized block, with subdivided plots, the main treatment being the combinations of nutrients used and the secondary treatment the collection times of the analyzes (0 h - 24 h). The treatments were the addition of the nutrients alone (N, P, K, Mg, Mn, and Zn) and combined (N + P + K + Mg + Mn + Zn) using the yeast *Pichia kudriavzevii*. All synthetic musts were prepared with 45g.L<sup>-1</sup> of xylose and 25g.L<sup>-1</sup> of glucose. It was determined the cell viability, bud rate, and bud viability at the beginning and at the end of fermentation. Among the treatments applied, a larger number of living cells were observed at the beginning of fermentation for the treatment containing nitrogen and addition of all nutrients, this fact can be explained because the yeast needs all these nutrients so that it can completely perform all its metabolism. It is concluded that the absence of nutrients affects the physiology of this microorganism mainly at the end of the fermentation process.

**Keywords:** Ethanol production; Macronutrients; Micronutrients; Synthetic broth.

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