

Project for the production of yeast and yeast extracts from whey.

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The whey is pasteurized at a temperature of 80 ° C for 5 minutes. The pasteurized product is placed in an aerobic fermenter in which *Kluyveromyces marxianus*, a lactic yeast, grows using lactose. Fermentation takes place at a temperature of 30 ° C and pH 5.0. The consumption rate of the lactose substrate is as follows:

6.0 kg of lactose per hour/cubic meter of fermenter.

The conversion yields are:

kg of dry yeast per kg of lactose used kg 0.50 (yield 50%)

Since whey has 5.0% lactose (intended as an average value), there is the following production potential:

Volume of fermented whey per cubic meter of fermenter per hour:mc 0.12

The fermented broth is centrifuged then the 30% dry yeast cream is separated. The cream is dried using a spray dryer to obtain the yeast flour. As an alternative to the production of yeast flour, the cream can be subjected to "enzymatic autolysis": in this process, the yeast proteins hydrolyze to form amino acids.

The hydrolyzate product is centrifuged to separate:

- amino acid solution;
- solid yeast cell walls.

Some critical phases of the process have been identified and overcome with adequate technology, particularly:

- The stability of YEAST EXTRACT "over time.
- The transfer of oxygen during fermentation: yeast has a high oxygen demand for which a bioreactor is required which induces a high oxygen / liquid broth transport coefficient (K_{la}).

21st International Conference on Industrial Chemistry and Aqua Technology

November 25-26, 2020 | Webinar

- The stability of the fermentation medium in terms of yield, contamination and growth rate.

Conclusions

The described technology allows:

1. To use a poor material to produce high value added yeast and yeast extracts.
2. The production of yeast extracts currently in the world takes place from *saccharomyces*; in this process yeast extract is produced from lactic yeasts with equivalent nutritional and flavor characteristics.
3. The demand for yeast extract in the world is growing sharply as it is also used as a substitute for glutamate, which has been declared carcinogenic.

Biography

Giuseppe Marchionni is a Master's Degree in Industrial Chemistry with over 30 years of experience in the biotechnology industry, in the management of civil and industrial wastewater treatment plants. Author of 4 industrial patents, responsible for research projects in the agri-food industry, and he is also collaborating as a researcher with national Universities and research institutes in projects and researches on the development of alternative energy sources technologies.