

Industrial Chemistry 2020-Title: Project for the production of yeast and yeast extracts from whey- Giuseppe Marchionni - Marchionni srl

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Abstract

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.

The amino acid solution, after concentration in reverse osmosis, is dried in a spray drier to form "YEAST EXTRACT". Cell walls are used to produce GOS and glutathione.

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

Conclusions

The described technology allows:

To use a poor material to produce high value added yeast and yeast extracts.

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.

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.

Cook's yeast is the normal name for the strains of yeast usually utilized in preparing bread and pastry shop items, filling in as a raising specialist which makes the bread rise (grow and get lighter and milder) by changing over the fermentable sugars present in the mixture into carbon dioxide and ethanol. Bread cook's yeast is of the species *Saccharomyces cerevisiae*, and is similar species (yet an alternate strain) as the caring ordinarily utilized in alcoholic maturation, which is called brewer's yeast. Baker's yeast is likewise a solitary cell microorganism found close by the human body.

The utilization of steamed or bubbled potatoes, water from potato boiling, or sugar in a bread batter gives food to the development of yeasts; nonetheless, a lot of sugar will dry out them. Yeast development is hindered by both salt and sugar, yet more so by salt than sugar. Some sources state fats, for example, spread and eggs, hinder yeast growth, others state the impact of fat on mixture stays muddled, introducing proof that limited quantities of fat are gainful for heated bread volume.

Saccharomyces exiguus (otherwise called *S. minor*) is a wild yeast found on plants, grains, and natural products that is sometimes utilized for preparing; notwithstanding, as a rule, it isn't utilized in an unadulterated structure yet comes from being spread in a sourdough starter.

Yeast separates comprise of the phone substance of yeast without the phone dividers; they are utilized as food added substances or flavorings, or as supplements for bacterial culture media. They are frequently used to make exquisite flavors and umami taste sensations, and can be found in an enormous assortment of bundled food, including frozen suppers, saltines, nibble nourishments, sauce, stock and that's just the beginning. They are plentiful in B nutrients (however not B12), as are of specific significance to veggie lovers and vegans. Yeast removes and aged nourishments contain

glutamic corrosive (free glutamates), an amino corrosive which adds an umami flavor. Glutamic corrosive is found in meat, cheddar, organisms (mushrooms), and vegetables, for example, broccoli, and tomatoes.

Yeast extricates in fluid structure can be dried to a light glue or a dry powder (yet this isn't equivalent to nourishing yeast).

The cycle to make yeast separate was designed in the nineteenth century by Justus von Liebig. Yeast cells are warmed until they burst, at that point the phones' own stomach related chemicals stall proteins down into less complex mixes (amino acids and peptides), a cycle called

autolysis. The insoluble cell dividers are then isolated by axis, separated, and as a rule splash dried.

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.