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Techno-Industrial Platform Development for Probiotics: From Slant to Bulk Powder

Nowadays, probiotics are widely considered not only as health supplement but also as biotherapeutic agent. They are widely defined as “live microorganisms which feed on or use in adequate amount will beneficially affects the host by improving its microbial balance”. For years, different bacterial and yeast strains belong to Lactobacillus, Entorobacter, Bifidobacterium, Saccharomyces are widely used. In particular, Saccharomyces boulardii exhibited many functional properties and widely used as biotherapeutic yeast. In addition, recent research reported also on the high potential of this yeast as delivery system of inorganic essential elements for human health such as chromium and selenium. However, it is still challenging (in upstream, downstream and formulation of the final product) to produce this type of probiotic in industrial scale. In this work, a complete industrial platform design as complete business model for large scale probiotic yeast powder will be presented. In this platform, a special type of yeast adapted to dryness and high temperature stress was used to increase to decrease the cost of downstream process by replacing freeze drying process to spray drying and to increase the shelf-life of the product. Furthermore, complete bioprocess design targeting to cultivation of yeast in high cell density culture with minimal alcohol production by using exponential feeding strategy in large scale stirred tank bioreactor will be presented. The platform technology was further developed to produce selenium enriched yeast to increase the health benefit of this type of probiotic yeast and to be used as potential source of organic selenium food supplement.

Biography

Prof. Hesham Ali El Enshasy is the Director of Institute of Bioproduct Development (IBD) and professor in bioprocess engineering, (UTM, Malaysia) and the current Co-Chair for Division 15A (Food), (AIChE, USA). Prof. El Enshasy received his B.Sc. and M.Sc. Microbiology (Ain Shams University, Egypt), Dr. rer. Nat. Industrial Biotechnology (TU Braunschweig, Germany), M.Sc. Technology Management (UTM, Malaysia). He has two technology patents and more than 150 publications in peer reviewed international journals and books. He was invited as keynote, plenary and guest speaker in more than 60 international conferences. He is also advisory board member and bio-business consultant for international companies.

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