

Enzymatic Hydrolysis of Flaxseed to Produce Alpha-Linoleic and Linolenic Acid



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Abstract

Microbial lipases have numerous potential applications in the bioprocessing industry due to their variety and versatility. Canada, in particular Saskatchewan is one of the worldwide leaders in the production of flaxseed crops accounting for 40% of crop production. Flaxseed oil is a viable source of plant based α -linoleic and linolenic acids (omega-6 and omega-3). Flaxseed oil contains high amounts of linolenic acid and moderate amounts of linoleic acid. The concentration of these essential free fatty acids in flaxseed oil can be increased via the process of enzymatic hydrolysis. Alpha-linoleic and linolenic acid are high value nutritional supplements in great demand to the pharmaceutical and health industries. Humans cannot synthesize these fatty acids within the body and must consume them in their diets or in the form of supplements thus, increasing the desired free fatty acid content within flaxseed oil is a viable solution to this need. The focus of the present work is to produce α -linoleic and linolenic free fatty acids catalyzed by microbial lipases. In addition, the optimization of the enzymatic hydrolysis reaction conditions and use of flax seed oil as feedstock and growth medium will be studied in the present work. Initial experiments showed an increase of 78 wt. % of free fatty acid yield following optimized hydrolysis using lipase from *Aspergillus niger* and 96% wt. % increase using lipase from *Candida rugosa*.



Biography:

Dylan Scheibelhoffer will be completing her Masters of Science in Engineering in the fall of 2020 from the University of Saskatchewan in Chemical and Biological Engineering.

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