



ENZYMATIC SYNTHESIS OF FUCOSYL-OLIGOSACCHARIDES BY TRANSGALACTOSYLATION REACTION

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Introduction. Synthesis of oligosaccharides is currently receiving a great deal of attention due to the important role of these compounds in many biological processes. The use of glycosylhydrolases in the synthesis of oligosaccharides is an attractive way, since these enzymes are generally more available, and less expensive than glycosyltransferases, and do not require expensive sugar nucleotide donors¹. There is a growing interest in the availability of human milk oligosaccharides, especially of fucosyl-oligosaccharides, to protect infants from enteric pathogens during early development². The aim of this study was to synthesize a fucosyl-oligosaccharide by transgalactosylation reaction with β -galactosidase from *Aspergillus oryzae*.

Methods. β -galactosidase from *Aspergillus oryzae* was used. The enzymatic reaction was performed at 60 ° C with constant agitation at 200 rpm at pH 4.5, for 12 h using lactose as donor and fucose as acceptor at different concentrations (ranging from 10 to 200mg/mL) of each carbohydrate. The synthesis of the fucosyl-oligosaccharide was determined by HPLC.

Results. Figure 1 showed that the higher the amount of the initial concentration of sugars, the higher the amount of fucosyl-disaccharide formed. The composition of the disaccharide formed was determined identifying the resulting monosaccharides by HPLC after an acid hydrolysis. The synthesized disaccharide consists of a molecule of galactose and fucose.

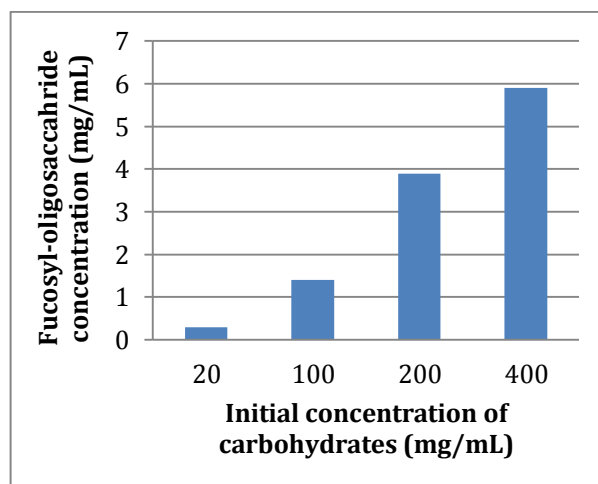


Fig.1 Effect of the initial concentration of carbohydrates in the synthesis of the fucosyl-oligosaccharide

Conclusions. The synthesis of a fucosyl-oligosaccharide by β -galactosidase proved to be a good alternative for the production of this compound however working in different strategies to increase yield is necessary. The fact that the oligosaccharide synthesized by this method contains fucose in its structure, is of great importance, since the main objective of this study was to synthesize compounds structurally similar to those present in breast milk.

References.

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