# ENZYMATIC SYNTHESIS OF GALACTO-OLIGOSACCHARIDES FROM WHEY LACTOSE

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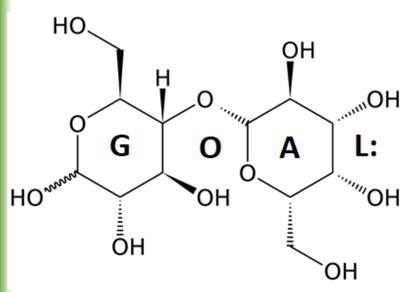



Examine the possibility of using lactose from whey, as an environmentally harmful by-product of the dairy industry, to obtain the maximum yield of galacto-oligosaccharides (prebiotics) at different initial concentrations of β-galactosidase enzyme from Aspergillus oryzae (0.1-1 g / l) and whey concentrations in the range of 10-40 % (w / v).

## RESULTS AND DISCUSSION:

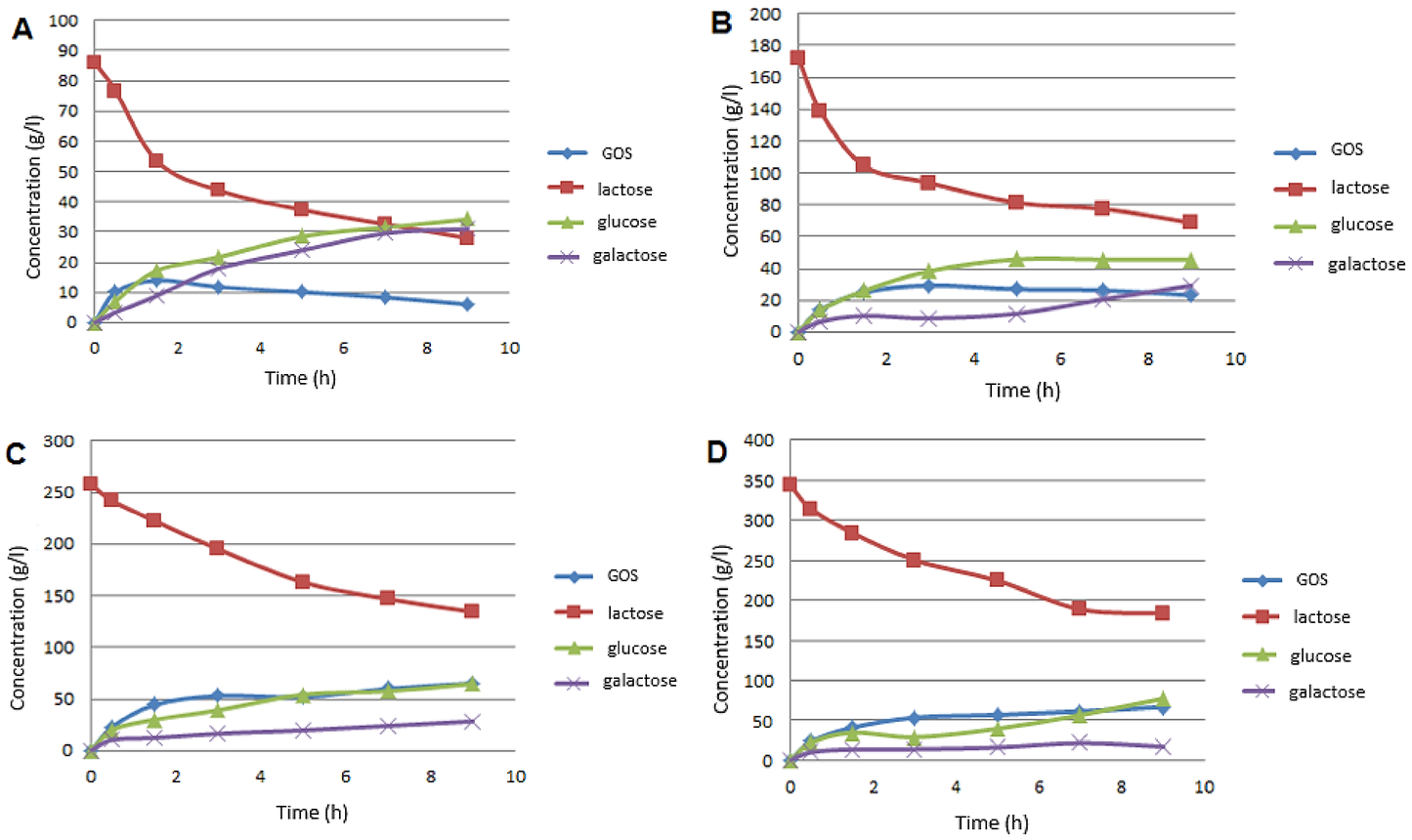



**Figure 1:** The course of the reaction of galacto-oligosaccharide synthesis. The reaction was performed at a whey concentration of 10 % (a), 20 % (b), 30 % (c) 40 % (d) in 0.1 M sodium acetate buffer (pH 4.5) and an enzyme concentration of 0.2 mg / ml of β-galactosidase from *A. oryzae* at 45 ° C

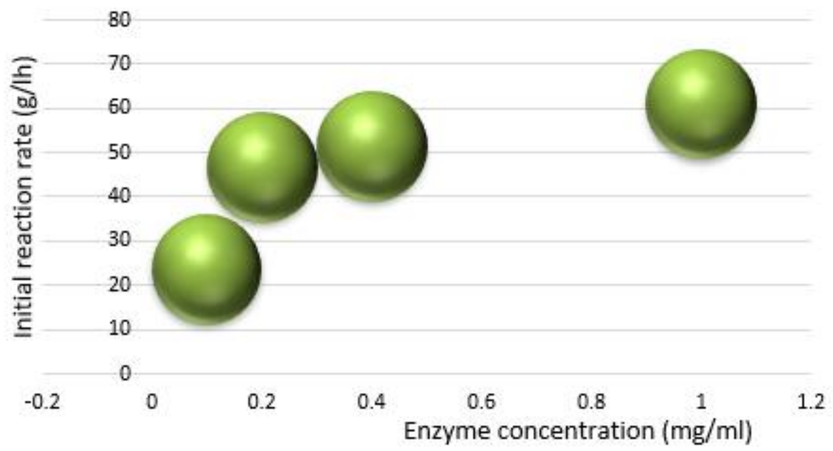
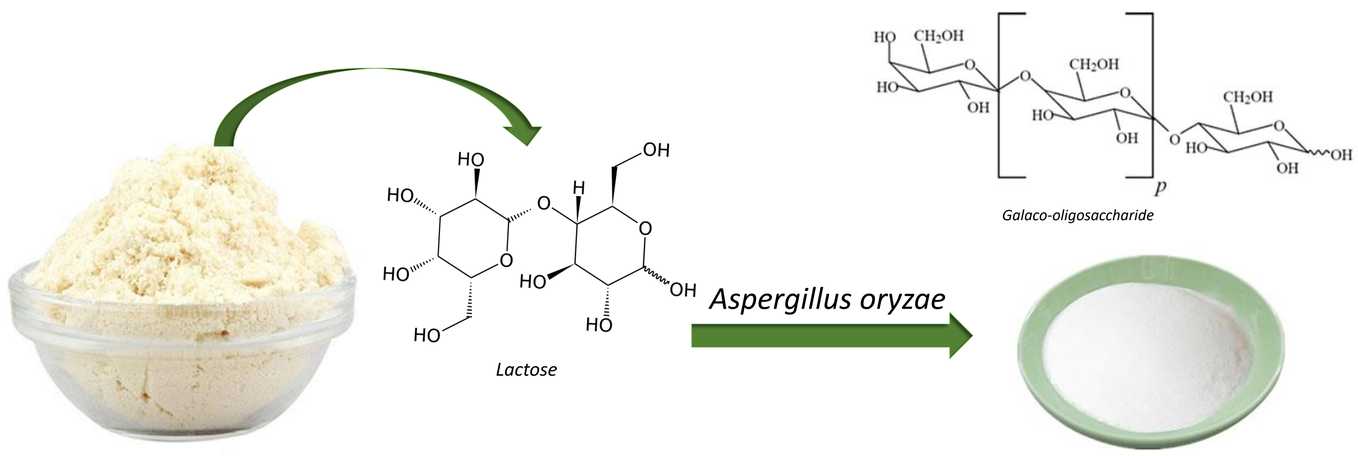



**Figure 2:** Comparison of galacto-oligosaccharide yields obtained with pure lactose and whey lactose of appropriate concentrations

✓ With increasing enzyme concentration (0.2-1 g / l), the increase in the initial reaction rate is significantly less pronounced. The optimal concentration for the synthesis of galacto-oligosaccharide from whey lactose is 0.2 g / l.

✓ Time is one of the key parameters when choosing the optimal conditions for the synthesis of galactooligosaccharides and these optimal times in the reaction conditions are 1.5 h, 3 h, 7 h and 9 h for initial concentrations of 10 % whey, 20 % whey, 30 % whey and 40 % whey, respectively.




## CONCLUSION:

✓ β-galactosidase from *Aspergillus oryzae* in the system with whey, as the only substrate, catalyzes the synthesis of galacto-oligosaccharides.

✓ The optimal concentration of enzymes for the synthesis of galacto-oligosaccharides from whey lactose is 0.2 g / l.

✓ Maximum product yields (about 70 g / L) are achieved at a whey concentration of 30 % and an enzyme concentration of 0.2 g / L after 12 h.