

Decreasing Sugar Level by Enzymatic Hydrolysis of Lactose in Fruit Yogurt

Authors: [Damla Özçelik](#)

Affiliation: [Sütaş Dairy Products Co. Inc., Uluabat Mah. 16700 Karacabey, Bursa, Türkiye](#)
dozcelik@sutas.com.tr

Kluyveromyces lactis β -Galactosidase was used to hydrolyze lactose in compound milk that was used for the production of stirred fruit yogurt. Hydrolysis was simultaneously conducted with the fermentation which was done at 38 °C until 4.65 pH was obtained. The sucrose added was decreased to tolerate the sweetness which gained due to lactose hydrolysis. Lactose and sucrose concentration in the recipe issued to study was 4.7% lactose and 7.1% sucrose (w/w). Trial products were produced by reducing the sucrose levels of 5.3% and 5% in yogurt milk with the addition of lactase. For each recipe sensory evaluations were done. For the recipe that contains %5,3 lactose, sweetness showed a non-significant difference between the control sample ($\alpha = 0.05$). At the end of fermentation, lactose was analyzed, and 97.8% lactose conversion was observed. The percentage of sucrose decreased in the recipe which showed no difference was 25%. As a result, for 1 g of hydrolyzed lactose, 0.4 g of sucrose was decreased from the recipe while obtaining the same sweetness. Besides sensory evaluation, shelf-life analysis was also conducted to see how post-acidification was affected by hydrolyzed lactose. pH values in both the control and trial samples were in the acceptance range at the end of shelf life.

Keywords: Fruit yogurt; lactose hydrolysis; lactose.

References

- [1] D. K. Mahato, R. Keast, D. G. Liem, C.G. Russell, S. Cicerale and S. Gamlath (2020). Sugar reduction in dairy food: An overview with flavoured milk as an example, *Foods* **9** (10), doi:10.3390/foods9101400
- [2] V.S. O'Leary and J.H.Woychik (1976). Utilization of lactose, glucose, and galactose by a mixed culture of *Streptococcus thermophilus* and *Lactobacillus bulgaricus* in milk treated with lactase enzyme, *App. Env. Mic.* **32** (1), 89-94.
- [3] R. S. Shallenberger (1963). Hydrogen bonding and the varying sweetness of the sugars, *J. Food Sci.* **28** (5), 584-589.
- [4] E. Yamamoto, R. Watanabe, T. Ichimura, T. Ishida and K. Kimura (2021). Effect of lactose hydrolysis on the milk-fermenting properties of *Lactobacillus delbrueckii* ssp. *bulgaricus* 2038 and *Streptococcus thermophilus* 1131. *J. Dai. Sci.* **104** (2), 1454-1464.