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Calf and Lamb Lingual Lipases as Catalysts for the Hydrolysis of Tributyrin, Triolein, and 4-Nitrophenylacetate

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The lingual lipases from calf and lamb were used as catalysts for the hydrolysis of the lipid, tributyrin, and the relatively hydrophilic ester, 4-nitrophenylacetate. The effects of pH on these reactions and of temperature on the reaction against 4-nitrophenylacetate were measured. Calf lingual lipase was used also to catalyze the hydrolysis of triolein. Under comparable conditions, calf lingual lipase was a more effective catalyst than lamb lingual lipase. Michaelis-Menten constants were evaluated and showed that the preferred substrates for the enzyme were tributyrin, then 4-nitrophenylacetate, and then triolein. For tributyrin and 4-nitrophenylacetate, the optimal pH were 6.9 and 8.0, respectively, for the calf enzyme and 6.6 and 6.8, respectively, for the lamb enzyme. The temperature optima against 4-nitrophenylacetate were 37.5 and 30 °C for calf and lamb lingual lipases, respectively.

Key Words: calf • lamb • lingual lipase • catalyzed hydrolysis

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[Abstract]