

Enhancing Lecithin Functionality: Enzymatic Production of Lyso-Lecithin from Soy

pH Drop as an Indicator of Lyso-Lecithin Formation

This document presents a comparison of enzymatic hydrolysis of soy lecithin using phospholipase A2 (PLA2). The resulting drop in pH over time, as shown in the accompanying graphs, serves as a clear indicator of lyso-lecithin formation through the release of free fatty acids. Lyso-lecithin offers enhanced emulsifying properties, improved digestibility, and greater functionality across food, feed, and pharmaceutical applications, making it a valuable ingredient in high-performance formulations.

A clear indicator of this enzymatic activity is the measurable drop in pH over time, shown in Figure 1. As PLA2 breaks the ester bond and releases free fatty acids, the acidification of the solution corresponds with lyso-lecithin formation. The gradual pH decline seen during incubation confirms the progressive hydrolysis of the phospholipids.

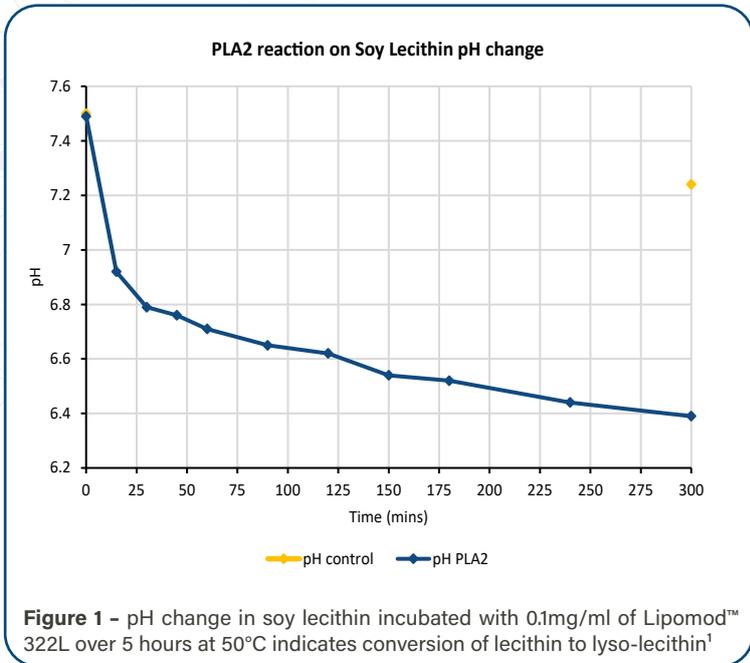


Figure 1 - pH change in soy lecithin incubated with 0.1mg/ml of Lipomod™ 322L over 5 hours at 50°C indicates conversion of lecithin to lyso-lecithin¹

Soy-derived lyso-lecithin offers significant commercial and functional advantages due to its enhanced amphiphilic properties, achieved through the selective hydrolysis of phosphatidylcholine by phospholipase A2 (PLA2). This enzymatic modification improves emulsifying efficiency, particularly in oil-in-water systems, enabling reduced dosage while enhancing stability in food, feed, and pharmaceutical formulations. In animal nutrition, soy lyso-lecithin facilitates improved micelle formation and lipid absorption, contributing to better energy utilisation and growth performance. Soybean is an advantageous source due to its high phospholipid content, consistent global supply, and cost-effective processing. Furthermore, enzymatic conversion offers a solvent-free, clean-label route that supports non-GMO and allergen-conscious product development. These combined attributes make soy-derived lyso-lecithin a high-value, multifunctional ingredient with broad applicability and strong market alignment.

¹ M.M. El-Abhar, G.I. Mahmoud, E.A. Hanafy, M.M. El-Mallah, S.M. El-Shami (2020) Comparative Study of Modified Soy Lecithins as Oil in Water Emulsions

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Looking to get more value from your oils or lecithin streams? Our application specialists can help you optimise enzyme performance in oil and lecithin processing. Whether you're working with soy, sunflower, or other vegetable oils, or need solutions aligned to specific process parameters, we'll tailor enzyme strategies to meet your goals. Partner with us to improve yield, functionality, and process efficiency, and turn your vision into measurable results.

