A Laboratory Exercise To Understand the Importance of Enzyme Technology in the Fruit-Processing Industry: Viscosity Decrease and Phenols Release from Apple Mash

In a 4-h laboratory exercise, students accomplish a series of enzymatic macerations of apple mash, assess the viscosity of the mash during the maceration, extract the juice by centrifugation, and measure the levels of antioxidant phenols extracted into the juice after different enzyme treatments. The exercise shows the impact of enzyme-catalyzed plant cell-wall degradation on the viscosity of apple fruit mash and on the extraction of antioxidant phenols into experimentally prepared apple juice. The exercise also demonstrates that pectinolytic and cellulolytic enzymes have different effects on the viscosity of apple mash. Depending on the academic skills and background of the students, various aspects of quantitative enzyme activity assessment and advanced data analysis of decay curves can be included in the postexercise discussions and reporting of the data.