

Title Effects of ultra-high pressure on biochemical and physical modification of lychee (*Litchi chinensis* Sonn.)

Author C. Phunchaisri and A. Apichartsrangkoon

Citation Food Chemistry Volume 93, Issue 1, November 2005, Pages 57-64

Keyword Ultra-high pressure; Lychee; Polyphenol oxidase; Peroxidase

### Abstract

To evaluate the possibility of using high pressure as an alternative to canning for lychee preservation, fresh lychees and samples preserved in syrup were subjected to various pressures (200–600 MPa), temperatures (20–60 °C) and times (10 or 20 min) and subsequently analysed for physical attributes, peroxidase (POD) and polyphenol oxidase (PPO) activities. Pressure treatment caused less loss of visual quality in both fresh and syrup processed lychee than thermal processing. The optimal pH for lychee POD and PPO were 5.0–8.0 and 7.0, respectively. Pressure treatment at 200 MPa caused a marked increase of POD activity and this effect was greater at 40 °C than at 20 and 60 °C. Pressure treatment at 400 and 600 MPa, and temperatures of 20–40 °C, did not affect the activity of POD, but some inactivation at 60 °C was observed. The combined effect of pressure and temperature on PPO activity were more marked at the longer treatment time (20 min) and under the more severe treatments. A pressure 600 MPa, at 60 °C for 20 min caused extensive inactivation of POD and PPO in fresh lychee, over 50% and 90% respectively but for those processed in syrup, the effects were less marked, presumably due to baroprotection by the syrup. Overall lychee POD was more pressure resistant than PPO.

**Abbreviations:** POD, peroxidase; PPO, polyphenol oxidase