

Title Effect of catechin and ferulic acid on melanosis and quality of Pacific white shrimp subjected to prior freeze–thawing during refrigerated storage

Author Nilesh Prakash Nirmal and Soottawat Benjakul

Citation Food Control, Volume 21, Issue 9, September 2010, Pages 1263-1271

Keywords Freeze–thawing; Pacific white shrimp; Polyphenoloxidase; Melanosis; Quality; Ferulic acid; Catechin

Abstract

Melanosis of Pacific white shrimp (*Litopenaeus vannamei*) subjected to freeze–thawing with different thawing methods and various cycles were monitored during subsequent refrigerated storage (4 °C) up to 4 days. Melanosis score was lower in Pacific white shrimp thawed at 4 °C, compared with that found in samples thawed at room temperature or using tap water. Polyphenol oxidase (PPO) activity increased as freeze–thaw cycles increased ($P < 0.05$). Enhanced PPO activity was most likely associated with increased melanosis. Pacific white shrimp treated with catechin (0.05%, 0.1% and 0.2% (w/v)) or ferulic acid (1%, 2% and 3% (w/v)) and subjected to freeze–thawing with various cycles showed the retarded melanosis during the subsequent refrigerated storage of 4 days, compared with the control ($P < 0.05$). Treatment of shrimp with both phenolic compounds could impede the growth of psychrophilic bacteria and the spoilage as evidenced by the lowered psychrophilic bacteria count and total volatile base content (TVB). Sample treated with 0.2% catechin or 3% ferulic acid also exhibited the retarded lipid oxidation during the subsequent refrigerated storage, compared with the control ($P < 0.05$). Thus, either catechin or ferulic acid could be used as the potential additive to lower melanosis of shrimp with prior freeze–thawing.