

Radjai Porkunpoolsin 2014: Extraction and Utilization of Polysaccharide from Dried Malva Nut Fruits (*Scaphium macropodium Beume*) in Restructured Pork Meat. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Assistant Professor Tanaboon Sajjaanantakul, Ph.D. 202 pages.

Malva nut powder, water treated malva nut powder, and acid treated malva nut powder (0.02M HCl, 40 °C for 16 h) were solubilized to each respected gum with 0.05 M NaOH at 40 °C for 16 h, then freeze dried and grinded to powder. The viscosity of 0.5% w/v malva nut gum (MG), water treated malva nut gum (WMG), and acid treated malva nut gum (AMG) solutions at 90 °C were significantly decreased as compare to the sample at room temperature (25 °C) ($p \leq 0.05$). Upon cooling back to the room temperature, they regained the original viscosity. MG solutions gave higher viscosity at all temperature range (30-90 °C). MG solution (0.5%w/v) at pH 6-10 exhibited significantly higher viscosity as measured by Brookfield digital rheometer, than WMG and AMG solutions ($p \leq 0.05$). In addition, the viscosity of MG, WMG and AMG were affected by sodium chloride (NaCl) at a level of 1-5% ($p \leq 0.05$). At 2% NaCl (w/v) the viscosity of MG, WMG and AMG solution decreased 3.29, 2.83 and 2.30 times respectively, as compare to the sample in absence of NaCl.

Utilization of malva nut gums in restructured pork patty was studied. With addition of 0.3% (w/w) MG, the cooking loss, diameter change, and thickness change of restructured pork patties were decreased 16.08% 50.98% and 47.73%, respectively. While water holding capacity was increased 5.26% when compared with control without gum. But the shear force was lower than control so the sample was more tender. At the same level (0.1-0.3% w/w), MG, WMG and AMG were not significantly different in the cooking and textural property. Using 0.1% MG combined with 1.5% NaCl in restructured pork patties resulted in comparable cooking and textural property values as compared to full NaCl formula (2%). The combined level (0.1%MG + 1.5%NaCl) could decrease NaCl content used in restructured pork patties process up to 25%. Restructured pork patties with 0.1% MG combined with 0.2% sodium tripolyphosphate (STPP) gave comparable cooking and textural property values with full STPP formula (0.3%). This could reduce the usage of STPP up to 33%. After 10 days of storage, cooked restructured pork patties with 0.1% MG added sample had 1.3 times lower TBARS value than the 0.02% BHT added sample ($p \leq 0.05$). Addition of 0.1% MG could better inhibit oxidation reaction than the use of 0.02% commercial antioxidant BHT.

Student's signature

Thesis Advisor's signature