

Monrarm Intarasiri 2007: Improvement of Fermented Kanomjeen Noodle for Developed Frozen Ready-To-Eat Fermented Kanomjeen Product. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Professor Onanong Naivikul, Ph.D. 281 pages.

The retrogradation in food which contained mainly starch causes the increase in hardness and brittleness and the decrease in adhesiveness after a freeze-thaw treatment. This research aimed to modify fermented rice flour by an annealing treatment and to select an additive hydrocolloid in order to reduce the retrogradation and increase shelf life of frozen ready-to-eat Kanomjeen with chicken green curry. The 1:2 flour to water (w/w) fermented Chai Nat 1 rice flour (FRF) was subjected to annealing treatment at 55 °C for 24 h (ANF24) and 48 h (ANF48). The crystallinity, gelatinization and retrogradation properties and freeze-thaw stability of annealed flour were investigated. When compared to FRF, the crystallinity of ANF48 was significantly ( $p \leq 0.05$ ) increased from 22.36 to 25.39%. The gelatinization temperature and enthalpy of ANF48 was significantly ( $p \leq 0.05$ ) increased from 74.58 °C and 10.30 J/g to 76.53 °C and 12.68 J/g, respectively. At the fifth freeze-thaw cycle, the retrogradation enthalpy of ANF48 gel was significantly ( $p \leq 0.05$ ) decreased from 2.94 to 4.18 J/g. The syneresis percentage of ANF48 gel (51.43%) was lower than FRF gel (66.40%). Judged by panelists, Kanomjeen which was made from 40% ANF48 in FRF, was more favorable than the original Kanomjeen. The pasting property, gelatinization enthalpy, retrogradation enthalpy and freeze-thaw stability was investigated after the addition of CMC in the FRF. It was found that the peak viscosity and the setback was significantly ( $p \leq 0.05$ ) increased when the hydrocolloid concentration was increased. At the fifth freeze-thaw cycle, the gelatinization enthalpy and gel retrogradation of the CMC-added FRF significantly ( $p \leq 0.05$ ) decreased from 10.83 and 0.892 J/g to 8.60 and 0.030 J/g, respectively. The syneresis percentage of the CMC-added FRF gel (29.02%) was lower than FRF gel (56.76%). After a freeze-thaw process, the panelists preferred the Kanomjeen with 0.3% CMC over the original Kanomjeen. When the shelf life of Kanomjeen and chicken green curry was separately investigate, the shelf life of the original Kanomjeen was less than 5 days when stored at 4 °C and less than 49 days when stored at -18 °C, respectively. For 40% ANF48 in Kanomjeen, it could be stored less than 8 days at 4 °C and more than 56 days at -18 °C. For the Kanomjeen with 0.3% CMC, it could be stored less than 10 days at 4 °C and more than 56 days at -18 °C. All frozen sample stored at 4 and -18 °C did not significantly change texture ( $p > 0.05$ ) during storage. The chicken green curry was still accepted by panelist when stored less than 12 at 4 °C and more than 56 days at -18 °C. The microbiological property of ready-to-eat frozen Kanomjeen, stored at 4 and -18 °C for 12 and 56 days, met the requirement of the standard regulation for safety.

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Thesis Advisor's signature