

Namfon Charoenphan 2009: Effect of Osmodehydration and Calcium Addition on Quality of Frozen Cantaloupe. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Associate Professor Sanguansri Charoenrein, Ph.D. 103 pages.

The objective of this research was to study the effect of freezing rate (slow freezing (SF), medium freezing (MF) and quick freezing (QF)), different osmotic pretreatment (osmotic dehydration (OD), pulse vacuum osmotic (PVOD) at 100 and 300 mbar) and addition of calcium and pectinmethylesterase (PME) in 50% (w/w) sucrose solution on quality of frozen cantaloupe after storage for 3, 30, 60 and 90 days at -18°C. In the first experiment, a reduction in firmness (maximum force) was observed after SF, MF and QF as compared with fresh cantaloupe. QF samples had higher firmness than those with other freezing rates. In second experiment, the results showed that the increase of water loss and solid gain of osmotically dehydrated cantaloupe samples before freezing were not significantly different among the osmotic pretreatment ($p>0.05$). During storage times, the all osmotic pretreatments (OD, PVOD at 100 and 300 mbar) reduced moisture content and drip loss of samples ($p\leq 0.05$). While total soluble solids of all osmodehydrofrozen samples were significantly higher than that of the untreated sample. Moreover, ΔE^*_{ab} of all osmodehydrofrozen samples were significantly lower than that of the untreated sample. Furthermore, firmness values of sample treated with osmotic dehydration at atmospheric pressure (OD) were significantly higher than that of the osmotic dehydration in vacuum at 100 and 300 mbar and untreated sample. When storage times increased, most quality of each samples were not significantly different ($p>0.05$). In the third experiment, we found that addition of calcium and PME were effective in improving quality of freeze-thawed cantaloupe samples. At 90 storage days, samples treated with OD addition of calcium had highest firmness values and were not significantly different with samples treated with OD addition of calcium and PME. These results were ascribed to the effect of calcium on the cell wall strength of the cantaloupe tissue.

Student's signature

Thesis Advisor's signature