

Prajongwate Satmalee 2006: Acceleration of Aging Rice Stick Noodle by Using Low Temperature. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Assistant Professor Sanguansri Charoenrein, Ph.D. 122 pages.
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The most important step in producing rice stick noodle is the noodle sheet aging. Purposes of the step are to harden the sheet and to decrease the sheet adhesiveness due to starch retrogradation. This step takes about 8-12 hrs. or more than 40% of the overall process time which cause the production obstruction. From the previous works stated that low temperature could accelerate retrogradation. The objectives of this research were to study the effects of aging temperature and time on the noodle sheet retrogradation and the effect of accelerated aging on the qualities of noodles. Changes of textural index, enzyme susceptibility, DSC thermogram, crystallinity and cut surface morphology were used to study the effect of time and temperature on the retrogradation. Hardness was used as the textural index due to the good correlation between instrumental and sensory evaluation. Hardness of the aged sheet was significantly increased through the studied time except the 30°C aging. Aging at 0°C resulted in higher hardness values than other aging temperatures. The decreased in enzyme susceptibility was not clearly demonstrated but the lower the aging temperature, the lower the enzyme susceptibility. Those results paralleled with the DSC thermogram that showed the amylopectin retrograded in the 0°C aged samples but none of the amylopectin retrograded appeared in the 30°C aging. The thermogram indicated that the aging time had no influence on the retrograded enthalpy and amylose-lipid complex peak was found in all samples. This agreed with the crystallinity obtained from the x-ray diffractometer that illustrated the V-type pattern in all samples but the B-type pattern appeared only the 0°C aging samples. The fresh sheet cut surface morphology demonstrated the network forming and the cut surface became smoother when aged. The low temperature aging cause the rougher surface than the 30°C aging. Those results indicated that low temperature could accelerate the retrogradation. The sheet cutting experiment notice that 3 hrs. aging at 0°C gave the appropriate harden sheets and the noodle from the accelerated aging was not different in the texture qualities from the traditional aging. This research indicated that the aging period could be reduced form 12 hrs. to 3 hrs. by aging at 0°C without changing in the noodle qualities.

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