

Effect of Salts on the Quality of Foods by the Non-Thermal Processing

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Summary

Non-thermal treatments such as high-hydrostatic pressure treatment and supercooling freezing on agro-products are attractive because of less degradation of compounds, flavors, and functional properties. Food freezing was commonly used as the technology to keep the quality of foods. Only a few freezing processes such as freeze-drying, freeze-concentration and freeze-deconformation were used as the pretreatment of foods. We applied the freezing, including supercooling, for enrichment of functional components. Water-soaked or glutamate-soaked soybeans were frozen at -10, -20, -70 and -180°C. The treated soybeans were analyzed for the degree of partial destruction by using the LCR meter. The radius of Cole-Cole plots decreased in decreasing the freezing temperature. Distributions of free amino acids were analyzed. Concentrations of γ -aminobutyric acid (GABA) as the functional compounds in water-soaked or glutamate-soaked soybeans increased in increasing storage period up to 2 or 3 days of storage. The initial GABA production rates were estimated from the time course of GABA production. Water-soaked and freeze treated soybeans were correlated with the freezing temperature that the lower freezing conditions showed the larger GABA production rate, however those of glutamate-soaked and freeze treated soybeans were not. Except for the maximum GABA production rate, the initial GABA production rates decreased in decreasing pH of soybean samples. Therefore, the initial GABA production rate of freeze treated soybean was caused by the pH shift from the freeze-thaw-oriented partial destruction of internal structure.