

Development of Real-Time Measurement of Salinity Concentration to Evaluate Suitable Food Dipping States During Salting

Kyoko ISHIKAWA*, Masashi NAKO*, Shuya SATO* and Yoshinobu AKIYAMA*

*Department of Biotechnology, Faculty of Bioresource Sciences, Akita Prefectural University,
241-438 Kaidobata Nishi, Shimoshinjo Nakano, Akita 010-0195, Japan

E-mail:kyoko_ishikawa@akita-pu.ac.jp

For this study, we developed a novel real-time monitoring system using a stainless steel electrode to assess NaCl osmosis in the food interior by measuring electrical impedance. The NaCl penetration into agar gel sprayed with NaCl on the surface was evaluated using impedance. As the measured position of the electrode moves downward, a longer time is needed to obtain a constant impedance value. Measurement of the chloride concentrations in the model food that had been cut into four pieces (surface, upper, middle, and lower parts) revealed an extremely strong relation between the equilibrium period of the impedance value and the inner chloride concentrations of the model. Results confirmed that a similar impedance value was obtained if the concentration of NaCl sprinkled on the top of the gels was the same irrespective of points measured using the electrode. These results demonstrate that this impedance measurement method using an LCR meter is useful for real-time monitoring of NaCl osmosis in the food interior.

Keywords : Penetration, Real-time measurement, Salting process