

No. 0702

Safety Evaluation of Salts Produced by Membrane Salt-Production System

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Summary

In order to ensure the safety of edible salt, not only amounts of contaminants in food-grade salt but also concentrations of some agricultural chemicals (31 components) and harmful 5 elements (As, Cd, Cu, Pb and Sn), and the number of bacteria in the raw and the treated seawater collected from various salt producing process at an ion-exchange membrane salt-production plant were investigated from October, 2003 to December, 2007. The effects of anthropogenic pollutants including endocrine disrupting chemicals on fish and shellfish inhabiting the coastal seawater area near the plant were also investigated.

As a result, several kinds of agricultural chemical ingredients were detected in the river water, but the levels of these chemicals were markedly low in comparison with the environmental criteria. In seawater samples, only a few agricultural chemicals were found from May to July. On the other hand, no agricultural chemicals were detected both in the sand-filtrated seawater and in the ion-exchanged concentrated-seawater collected from the plant. Each harmful element in all samples was very low level compared to that of the environmental criteria. Little bacterium was detected in the ion-exchanged concentrated-seawater.

In fish derived from both the present test site and the southern coastal region of Wakayama prefecture (control site), significant differences were not found in hepatic microsomal cytochrome P-450 contents and brain acetylcholinesterase levels. In the inposex ratios in shellfish, no different was observed.

These findings suggest that for maintaining the high quality and the safety of edible salt, it is exceedingly important to improve the permselectivity of ion-exchange membranes, though the present examination on contaminants (31 agricultural chemicals and 5 harmful elements mentioned above) in four food-grade salts indicates the height of the safety of edible salt.