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Effect of Sodium Chloride on Inosine Monophosphatase Activity in Fish Meats and Degradation Rate of Inosinic Acid during Drying Process of Salted Fish Meats

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Summary

It is well known that inosine monophosphate (inosinic acid, IMP) accumulated in post-mortem fish muscle by degradation of ATP is taste-active component enhancing *umami* through the combined effect with glutamic acid. Since IMP is subsequently degraded to none-taste-active inosine and hypoxanthine, suppression of IMP degradation in processing is beneficial to enhance *umami* and consequently to improve the flavor of the processed seafood. The objectives of this study were to elucidate the effect of NaCl, which was essential for seafood processing, on IMPase activity of fish meats as well as IMP degradation during drying process of salted fish meats.

Although IMPase activity of crude enzyme prepared from horse mackerel meats decreased with increase of NaCl concentration from 0.1 M to 0.75 M, Further increase of NaCl concentration elevated IMPase activity. Consequently, the activity at 2.0 M NaCl was almost the same to that at 0.1 M NaCl. These trends were barely changed by rising of temperature, but pH decrease suppressed the elevation of activity in higher concentration than 0.75 M of NaCl. Comparing the activity level of other fish species, IMPase activity of cod was highest, and followed by those of flathead flounder, horse mackerel, and deepsea snapper in descending order. NaCl dependency of IMPase of deepsea snapper was similar to that of horse mackerel, but IMPase activity of cod and flathead flounder gradually decreased with elevation of NaCl concentration over 0.75 M.

In order to confirm if NaCl content affected the IMP decrease in processing of fish meats, degradation rates of IMP during drying process of salted meats with different NaCl content were examined. Degradation rate of IMP in salted meats with 1.2 mol/kg of NaCl was larger than that with 0.7 mol/kg, suggesting that IMPase activity was activated in salted meat with higher content of NaCl in drying process.

These results suggested that 0.3~0.5 mol/kg of NaCl content contained in salted-dried products suppressed enzymatic degradation of IMP and contributed to the taste enhancement regardless of fish species. However, considerable diversity was observed in the property of IMPase by fish species so that further study is required including classification of the characteristics of IMPase to make use of the research for development of taste-enhanced processed seafood.