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Effect of NaCl Concentration on Inhibition of Modori of Kamaboko by Addition of Rice Protein with Protease Inhibitory Activity

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Summary

Several endogenous proteases autohydrolyse partially proteins in Surimi (fish meat paste). In manufacture of Kamaboko, proteolysis by endogenous proteases in Surimi causes Modori (softening) and therefore lowering of quality of Kamaboko. In this study, we investigated on inhibition of the softening using rice protein with protease inhibitory activity. In particular, taking into consideration that Kamaboko contains usually 2-3% NaCl, the effect of NaCl concentration on the protease inhibitory activity of rice protein was examined. At concentrations from 1% to 4%, rice protein inhibited partially endogenous protease in surimi (pollack and lizard).

By using a synthetic fluorescent substrate of protease, we found that rice protein contains inhibitors toward papain like protease and that the extracts of surimi (pollack and lizard) showed papain like protease. On the basis of these results, we prepared model Kamaboko using surimi (pollack and lizard) as a starting material. When rice protein was added to surimi paste with 3% NaCl, the breaking force and deformation of Kamaboko obtained were higher than those without rice protein. Moreover, the whiteness of Kamoboko was improved by adding rice protein. Therefore, we clarified that the addition of rice protein to surimi was effective to prevent Kamaboko from Modori (softening) in the presence of 2-3% NaCl. Further study on clarification of relationship between degree of inhibition of protease activity in surimi and physical properties of Kamaboko is necessary.