Thesis Announcement

Oregon Sea Grant

Title: The Effect of Potassium Bromate on the Gel-Forming Ability of Pacific Whiting *(Merluccius productus)* Surimi

Author: Ramon Pacheco Aguilar

Degree: Ph.D.

Date: March 1989

Publication No.: ORESU-X-89-001

Department: Food Science and Technology
Oregon State University, Corvallis

The abundance and low fat content of Pacific whiting support its use for the production of surimi. The degradation of muscle proteins by myxosporidian secreted proteinase(s) has been associated with its soft texture. High residual activity is retained through the washing process used in the production of surimi and precludes the formation of a strong heat-set gel by surimi sols.

Physical, chemical and SDS-PAGE analysis defined the reinforced oxidation of free sulfhydryl groups on myofibrillar proteins to disulfide bonds by potassium bromate. SDS-PAGE demonstrated myosin degradation during heat-setting and the protection of myosin from proteinase attack by bromate. A level of 0.075% bromate inactivated 89.87% of the total proteinase activity in sols. It was assumed that cysteine proteinases were inactivated and residual activity was associated with proteinases with a serine active site.

Major improvement in gel cohesiveness and elasticity was observed at bromate levels $\leq$0.075% with only a slight improvement at higher levels. Maximum hardness was observed at 0.150%, with no ($P>0.050$) increase at higher levels. Brittleness was improved ($P>0.050$) by bromate levels $\geq$0.100%; no maximum degree of brittleness was observed within the range ($\leq$0.250%) of concentrations investigated. An optimum folding test grade of AA was achieved by a minimum of 0.150%.

Potassium bromate improved gelling characteristics of sols of Pacific whiting surimi through proteinase inactivation and reinforced disulfide formation during heat-setting. Improvements in cohesiveness and elasticity was primarily a function of proteinase inactivation. Maximum hardness and brittleness required additional oxidative capacity which was not fully required for an optimum folding test grade.