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Effects of frozen storage on the allergenicity of surimi gels from hake infected with Anisakis simplex larvae

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Surimi, a myofibrillar protein concentrate from fish muscle, is an intermediate foodstuff used as a basic ingredient in the manufacture of many seafood products. To obtain the final gels the surimi is ground with salt and the viscous sol formed turns to an elastic gel upon heating, producing changes in the structure of myofibrillar proteins which may entrap or react with remaining muscle proteins. Studies on sterilization of canned fish have shown that the detection of allergenic proteins, including those with high thermal resistance, decreases after heat treatment. Thus, during gel forming, the allergenicity of these proteins could be potentially affected. In order to continue in the designing of strategies to reduce the allergenic capacity of seafood products, we investigated the effect of solubilization in salt and heat treatment used on the gel forming process on the allergen concentration from heavily infected fish. The recognition of Anisakis allergens during long term frozen storage of surimi gels was also evaluated.

Hake muscle infected under controlled conditions (50 L3 larvae/100 g mince) was washed [3 cycles, muscle:washing solution, 1:4 (w:v)] with water, sodium phosphate buffer, sodium bicarbonate, or sodium hypochlorite. Two cryoprotectant blends were added to each of these four raw surimis: 4% sucrose+4% sorbitol and 4% sucrose+4% sorbitol+0.2% sodium pyrophosphate, thus making a total of 8 combinations. Each combination was ground with 2.5% of NaCl (3 min, 5°C), stuffed into stainless steel cylinders (30x30 mm), heated (90°C, 30 min), cooled in iced water and kept at room temperature (24-25°C) before measurement. Gels were made from frozen surimi (-20 °C) after 90 or 180 days. Also, gels from chilled surimi were frozen stored for 90 and 180 days. Ani s 4 and A. simplex antigens were quantified by immunodetection (Dot blot) and immunohistochemistry.

The heat treatment decreased the detection of Ani s 4. This decrease was higher with surimi gels made from frozen surimi than with gels made from chilled surimi and frozen stored under the same conditions of time and temperature.

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