Frontiers in Food, Drug and Natural Sciences (2025), Vol 3: 22-30
An international peer-reviewed online journal
Available online: fd-science.com

Review Article

Enhancement of gel strength and quality in surimi-based products: The influence of natural additives and processing techniques

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ARTICLE INFO

Received: 28 April 2025
Received in revised: 19 May 2025
Accepted: 30 May 2025
Published online: 2 June 2025

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ABSTRACT

Surimi, a highly refined fish protein concentrate, occupies a pivotal position within the seafood industry, serving as a versatile foundation for various products. The origins of surimi production can be traced back over nine centuries; however, it underwent significant modernization in the 1960s, evolving into a global enterprise, particularly prominent in Japan, China, and South Korea. The production of surimi involves a comprehensive series of processes, including deboning, washing, refining, and stabilization through the application of cryoprotectants, followed by freezing and packaging. The gelation mechanisms pertinent to surimi, encompassing thermal, cold-set, high-pressure, transglutaminase-mediated, and pH-dependent gelation, are crucial for achieving the desired texture and stability. The integration of these processes with various additives serves to enhance the gel strength, elasticity, and water retention of surimi products. The additives utilized may be of animal origin, such as plasma proteins, egg whites, and fish gelatin, or plant-based, including legume proteins, starches, and rice flour. Furthermore, cryoprotectants, such as polyols and gums, along with functional additives like ascorbic acid and unsaturated fatty acids, contribute to the preservation, stability, and nutritional profile of surimi. These techniques and additives collectively facilitate the production of high-quality surimi-based products characterized by improved texture, flavor, and shelf life, thereby increasing their popularity in the global marketplace for a diverse range of seafood offerings.

Keywords: Additives; Elasticity; Fish; Gel strength; Surimi.