Study on the development of non-fish meal and non-fish oil diet for red seabream Pagrus major using with microalgae

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博士学位論文内容要約
Summary

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論文題目 Title	Study on ohmic heating processing of surimi-based products		

Ohmic heating is a heating process in which alternating electric current passes through electrically conducting food products. Heat is internally generated due to the electrical resistance of the food materials and conducts within the samples. For this reason, heat is readily transferred within the sample, resulting in a rapid heating rate and uniform heat distribution. This is a striking contrast to conventional heating methods in which the temperature of the product increases relatively slow because heat penetrates from the external heating medium.

Ohmic heating has been applied to surimi for the last 30 years. Surimi is washed minced fish muscle mixed with cryoprotectants such as sucrose and sorbitol. The fish muscle consists of salt soluble myofibrillar proteins and has unique gelling properties that make it useful as a food base in seafood analogs. Ohmic cooking method has been utilized to evaluate the gel-forming ability of various forms of surimi and surimi seafood. However, further study is still needed to utilize more effectively this heating method in the production of surimi-based products.

This dissertation will review various features of ohmic heating in surimi and surimi seafood as affected by processing and quality parameters.

Several types of surimi were used (croaker SA grade surimi, Alaska pollock FA, A, RA grades surimi) as materials; Fish oil, sodium chloride were used as additional ingredients. Ohmic heating machine was operated under AC current with the frequency of 20 kHz, the range of voltages from 10 to 50V. This research revealed that the electrical conductivity of surimi paste varied with the added components (salt, fish oil) and temperature. Changes in electrical conductivity affected the heating conditions of ohmic heating. Slow heating rate was more suitable for heating a high-grade of surimi that contains less or no protease enzymes. The heating

rate also influenced the gel properties of emulsified surimi paste by OH. These findings in this study will provide a useful reference for the industry to apply ohmic heating to the manufacturing of high-quality surimi-based products.