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# Physico - Chemical Properties of Salted Meat by Fiber Optics

## Optical Characteristics in Brightness and Rheological Properties of Heated Carp Meat

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Summary

Optical characteristcs in brightness of heated muscle pieces of carp *Cyprinus carpio*, red seabream *Pagrus major*, and bigeyed tuna *Thunnus obesus* were studied by comparing with rheological properties of these fish muscle reported by us previously. Raw mest samples were heated at 5 ℃ intervals in the range of 30 - 90 ℃ for 5 min. The surface of the each samples were illuminated by a halogen lamp and adjusted to 1,000 *lx* in luminous density. Once the image of the samples was obtained by a computer vision system, it was digitized and processed for feature extraction and analysis. The software used in our system was Optimas (Bioscan, Inc.,). The brightness of an object was a function of the luminous intensity. Thus, luminous strength of the sample surface was converted to the brightness expressed gray scale values in the range of zero (pure black) - 255 as a maximum (pure white), a total of 256 = $2^8$ gray scales, determined by the resolution of the image acquisition elements.

Changes in brightness of carp muscle by heat was independent of rheological parameters such as the instantaneous modulus, the elastic modulus, the viscosity, and the rupture strength without at 48 ℃ of the heated fish meat samples. However, derivative of the brightness with respect to heat temperature indicated three obvious inflection points at 48 ℃, 62 ℃ and 80 ℃, and closely corelated to the behavior of endothermic heat flow at 47 ℃ for myosin, 70 ℃ for F - actin and 80 ℃ for other components. The inflection point for the brightness at 48 ℃ and 62 ℃ was due to the thermal denaturation of myosin and collagen, respectively. Distinction of changes in brightness by heat between red fish - meat, bigeyed tuna, and white fish - meat, red seabream, was little detected despite difference in the content of myoglobin and hemoglobin.

These results obtained in this work must be applied to our investigation of salted meat by a fiber optcs in future.