

**DEVELOPMENT OF CALCIUM SUPPLEMENT
FROM THE BONES OF YELLOW FIN TUNA
(*Thunnus albacares*)**

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ABSTRACT

Calcium supplement is a preparation intended to supply calcium that are missing or not consumed in sufficient quantity in a person's diet and it used to boost the Calcium content of the diet. Calcium supplement for human consumption was prepared by using Yellow fin Tuna (*Thunnus albacares*) fish bones by several processing steps including, pretreatment by using NaOH, followed by neutralization step and drying. Pretreatment step was carried out by boiling with different Sodium Hydroxide (NaOH) concentrations and time combinations. Experimental Design 01 was conducted to determine most suitable range of NaOH Concentration (6%, 8%, 10%) time (70 minutes, 90 minutes, 110 minutes) combination. Experimental Design 02 was carried out to determine best NaOH Concentration (9%, 10%, 11%) time (80 minutes, 90 minutes, 100 minutes) combinations and evaluated the softness and color of the treated fish bones by considering dissolution of fish bones in NaOH solution.

After selecting the best sample, treated bones were washed with running tap water for 07 times and drained to remove excess moisture under room temperature (30 °C). Drying step was carried out with Experimental Design 03 (S₁ - 80 °C,70 minutes, S₂ - 80 °C,80 minutes, S₃ - 80 °C,90 minutes, S₄ - 90 °C,70 minutes, S₅ - 90 °C,80 minutes, S₆ - 90 °C,90 minutes, S₇ - 100° C,70 minutes, S₈ - 100 °C,80 minutes, S₉ - 100 °C,90 minutes) and evaluated the Moisture content, Drying Kinetic Rate Constant and Calcium content for each sample. The selected best sample (S₇) was further tested for proximate composition and counted the Total Plate Count (TPC).

The most appropriate processing method was evaluated by considering Moisture content, Calcium content and Drying Kinetic Rate Constant of the samples in Experimental Design 03 and it was boiling the fish bones in 10% NaOH at 90 °C for 80 minutes, neutralization by 07 times and drying the neutralized pretreated fish bones, at 100 °C for 70 minutes. The Proximate composition of the final product (S₇) was Crude fat 13.433%, Crude protein 7.303%, Crude ash 75.33% and 5.2% Moisture and Lead content 0.01 mg/Kg. The calcium composition of the selected final product was 30.6% and it met the standard requirements for supplementary foods and this research will be indicate significant role in value addition sector of aquatic byproducts in Sri Lanka.

Key words: Calcium supplement, Drying Kinetic Rate Constant (k), Moisture Content, Softness of fish bones, Value addition.