

Extraction of Bone Powder from Yellowfin Tuna (*Thunnus albacares*) and Swordfish (*Xiphias gladius*) Bones & Analyse their Mineral Content

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Fishbones are one of the main sources of Calcium and other minerals. During fish processing, nearly 30-60% of fish body weight discard as head, skin, viscera, backbones, and fins. The objective of the present study was to the extraction of bone powder from Yellowfin Tuna (*Thunnus albacares*) and Swordfish (*Xiphias gladius*) bones & analysis their mineral contents. Yellowfin Tuna and Swordfish bones were collected from a local fish processing company. Frozen bones were thawed for 16 hours at 20°C to remove ice. Large flesh parts were removed from bones and cut into 10cm size pieces and the remaining minor flesh particles were removed by soaking in 2M NaOH for 24 hours at room temperature. Bones were first washed with tap water to remove fat, dissolved protein, aroma, and to remove microorganisms bones were kept in 0.1% citric acid (bone material to citric acid ratio of 1:5 (w/v) for 0.5 h) and 5% H₂O₂ (bone material to H₂O₂ ratio of 1:5 (w/v), twice for 1 h) respectively. Further washed with tap water, dried, and grounded. Moisture and ash contents were analyzed by moisture meter (KERN, DBS60-3) at 105°C and Muffle Furnace (Labtech, LEP-P Type) at 550 °C for 16 hours respectively. Yellowfin tuna bone powder has 1.44% ash and 6.57% moisture content and Swordfish bone powder have 1.59% ash content and 6.35% moisture content respectively. P percentage was measured by Spectrophotometric Vanado Molybdate Method and Ca and other minerals were analyzed by Atomic Absorption Spectrophotometry after dry ashing. Dried Yellowfin tuna bone powder has Ca-15.5±0.45%, P-8.0±0.36%, Zn-8.3±0.4mg/kg, Fe-46.0±0.20mg/kg, Mn -7.3±0.46 mg/kg, Na-1.5±0.06%, Mg-0.25±0.03%, K-357±1.73mg/kg. Further, dried Swordfish bone powder has Ca-13.2±0.25%, P-7.8±0.25%, Zn-8.0±0.15mg/kg, Fe-10.7±0.25mg/kg, Mn-2.0±0.17mg/kg, Na-1.25±0.02%, Mg-0.25±0.03%, K-454±2.65mg/kg. The results of the present study shows Ca:P of the yellowfin tuna and sword fishbone powder nearly similar to the Ca:P of the human bones(2:1). The present study concludes that Yellowfin tuna and Swordfish bone powder are rich in Ca, P, and other microelements and can be used for the preparation of inexpensive and environmentally friendly value-added products such as Calcium tablets and diet supplements.

Keywords: Fish waste; Value-added products; Bone powder; Economy