

Development of a Simple Nontoxic Method to Extract Crude Fish Oil from Yellowfin Tuna (*Thunnus albacares*) Offal

G.M.V.T. Basuru¹, M.G.T.R. Kariyawasam², A.G.A.W. Alakolanga³ and E.D.N.S. Abeyrathne¹

¹*Department of Animal Science, Uva Wellassa University, Badulla, Sri Lanka*

²*Ceylon Fresh Seafood (Pvt) Ltd, Ja-Ela 11350, Sri Lanka*

³*Department of Export Agriculture, Uva Wellassa University, Badulla, Sri Lanka*

Among world fish processing industry yellowfin tuna is a dominating species that is responsible for high amount of waste generation during processing which makes a high level of by-product. Fish by-products consist with omega-3 poly unsaturated fatty acids that are vital in food and pharmaceutical industry. The study was targeted to develop an effective fish oil extracting method from yellowfin tuna gut comparing with a current existing extraction technique. The determined proximate composition of yellowfin tuna gut showed $4.87\pm 0.2\%$ of crude fat. The research was conducted with completely randomized design (CRD) with two treatments; wet press method (rendering) and the solvent extraction method. As the solvents Chloroform/Methanol (standard), Acetone, Petroleum ether, n-Hexane, n-Butanol and Ethanol were used separately in 1:2 ratio (Gut sample: Solvent). Finally fish oil yields were calculated on percentages and analyzed the chemical property indices (Iodine value, Peroxide value and Acid value) of extracted fish oil. The results revealed that the highest yield ($88.63\pm 2.76\%$) was obtained in wet press method. In solvent extraction Acetone performed the highest yield ($75.26\pm 1.85\%$) showing the significant difference in comparison with oil yields of Petroleum ether, Hexane, n-Butanol and Ethanol ($p < 0.05$). Iodine value of extracted fish oil from wet press method, Chloroform/Methanol, Acetone, Petroleum ether, n-Hexane, n-Butanol and Ethanol were 109.99 ± 0.57 , 103.94 ± 0.56 , 104.70 ± 0.47 , 104.53 ± 0.74 , 103.43 ± 0.37 , 106.15 ± 0.86 , and 105.83 ± 0.68 respectively. The obtained peroxide value (2.98 ± 0.05) and Acid value (1.04 ± 0.02) of wet press method also indicated higher values than the solvent extraction method which assures that solvent extraction had a low hydrolysis and low oxidation in comparison with the wet press method. As conclusion extraction with acetone is better comparing the quality of the oil extracted.

Keywords: Fish oil, Extraction, Solvents, Omega-3, Oil yield