# DEVELOPMENT OF A SIMPLE NONTOXIC METHOD TO EXTRACT CRUDE FISH OIL FROM YELLOWFIN TUNA (*Thunnus albacares)* OFFAL

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# ABSTRACT

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. The determined proximate composition of yellowfin tuna gut showed 4.87±0.2% of crude fat. The research was conducted 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). Secondary the extraction was conducted by using solvent combinations. Finally fish oil yields were calculated on percentages and analyzed the chemical property indices (Iodine value, Peroxide value and Acid value). The results revealed that the highest yield (88.63±2.76%) was obtained in wet press method. In solvent extraction Acetone performed the highest yield (75.26±1.85%) in single solvent extraction and in solvent combination extraction acetone/ ethanol/ hexane combination performed the highest yield (75.83±1.63%) showing the significant difference in comparison with oil yields of other solvents ($p<0.05$). Iodine value, Peroxide value, Acid value and TBARS values of extracted fish oil from wet press method were 109.9 ± 0.5, 2.98 ± 0.04, 1.04 ± 0.02 and 0.9 ±0.05 respectively that were higher than the oil quality parameters of solvent extraction. It proves that the solvent extraction had a low hydrolysis and low oxidation in comparison with the wet press method. Therefore extraction with solvents like acetone and acetone/ ethanol/ hexane combination are better comparing the quality of fish oil extracted.



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