

Fat contents and fatty-acid profiles of five species of tuna

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The total fat content and fatty acid profiles of the flesh of five tuna species skipjack (*Katsuwonus pelamis*), Yellow fin tuna (*Thunnus albacare*), Bullet tuna (*Auxis rochei*), Frigate tuna (*Auxis thazard*) and kawakawa (*Euthynnus affinis*) were obtained from Pitipana, Negombo landing site were determined. Samples of skin, red muscle, white muscle, head muscle and belly flap were taken to determine the total fat and the moisture content in each species. Total fat contents were determined by Majonnier method. For Gas Chromatography (GC) analysis of fatty acids, oils were extracted from the Bligh and Dyer method and the Fatty Acid Methyl Esters (FAME) were prepared by sodium methoxide method. FAMEs, were then identified by injecting into the GC (Agilent 4890 D) and FAMEs

were identified from previously prepared standard (cod liver oil) and from a reference standard (GLC 411). Concentration of each FOAME was calculated as a percentage of total FAMEs. Among these five tuna species the total fat contents in the flesh (red flesh and white flesh) were lower than 2%. Therefore these can be considered as lean fat fishes (lean <2%, low 2-4%, medium 4-8% high >8%). The distribution of fat in the different tissues was as follows; skin (3.41 ± 0.30 - 9.88 ± 0.99 %), red flesh (0.56 ± 0.11 - 1.23 ± 0.15 %), white flesh (0.54 ± 0.05 - 0.80 ± 0.12 %), head (1.05 ± 0.44 - 1.35 ± 0.80 %), and belly flap (0.66 ± 0.06 - 1.56 ± 0.22 %). The highest storage of fat was reported in the skin (3.41 ± 0.30 % - 9.88 ± 0.99 %), while the lowest storage was reported in white flesh (0.54 ± 0.05 % - 0.80 ± 0.12 %) in all five tuna species considered here. There was a negative correlation between the total fat content and moisture content (Pearson's correlation -0.853, $p < 0.05$). The fatty acid composition of Saturated Fatty Acids (SFA), Mono unsaturated Fatty Acids (MUFA), and Poly Unsaturated Fatty Acids (PUFA) were as follows; Yellow fin tuna: 20, 22, 58; skip jack: 17, 34, 50; frigate tuna: 18, 25, 56; bullet tuna: 20, 20, 58; Kawakawa: 26, 23, 41. The proportion of Eicosapentanoic acid (EPA, 20 5n-3) and Docosapentanoic acid (DHA, 22 6n-3) in the fat of yellow fin tuna (13.57%, 12.51%), bullet tuna (13.51%, 7.23%) and skip jack (4.34%, 12.63%) were high compared to other two species namely; frigate tuna (6.96%, 4.86%) and kawakawa (8.65%, 5.89%). The proportion of SFA was high in kawakawa, while others recorded less than 20% of SFA. The proportions of MUFA were; Yellow fin tuna 80%, skipjack 73%, frigate tuna 82%, bullet tuna 78%, and kawakawa 63%.