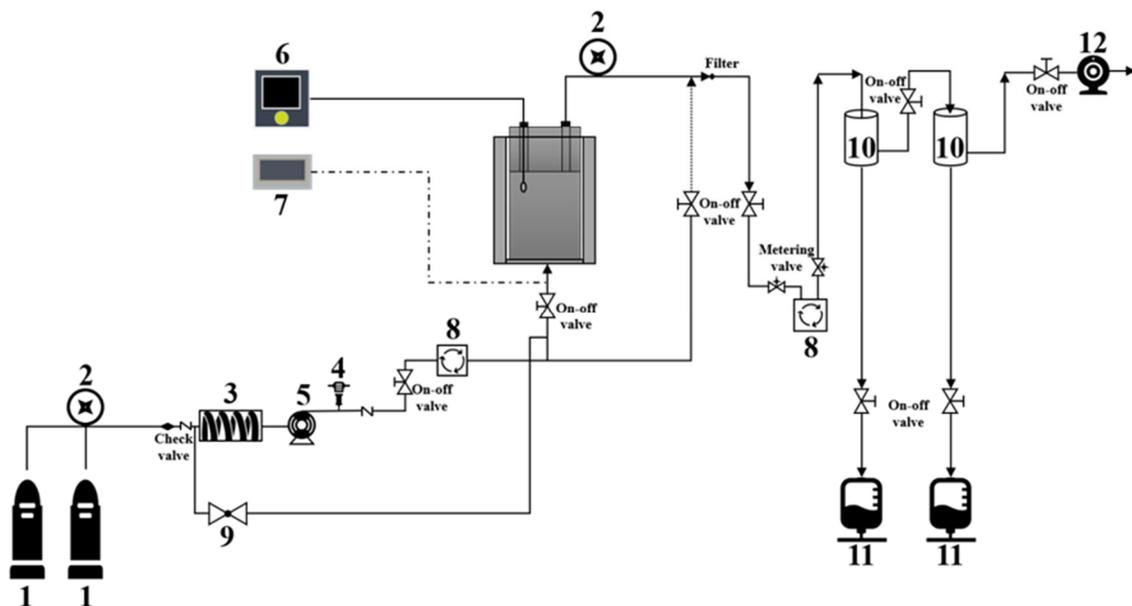


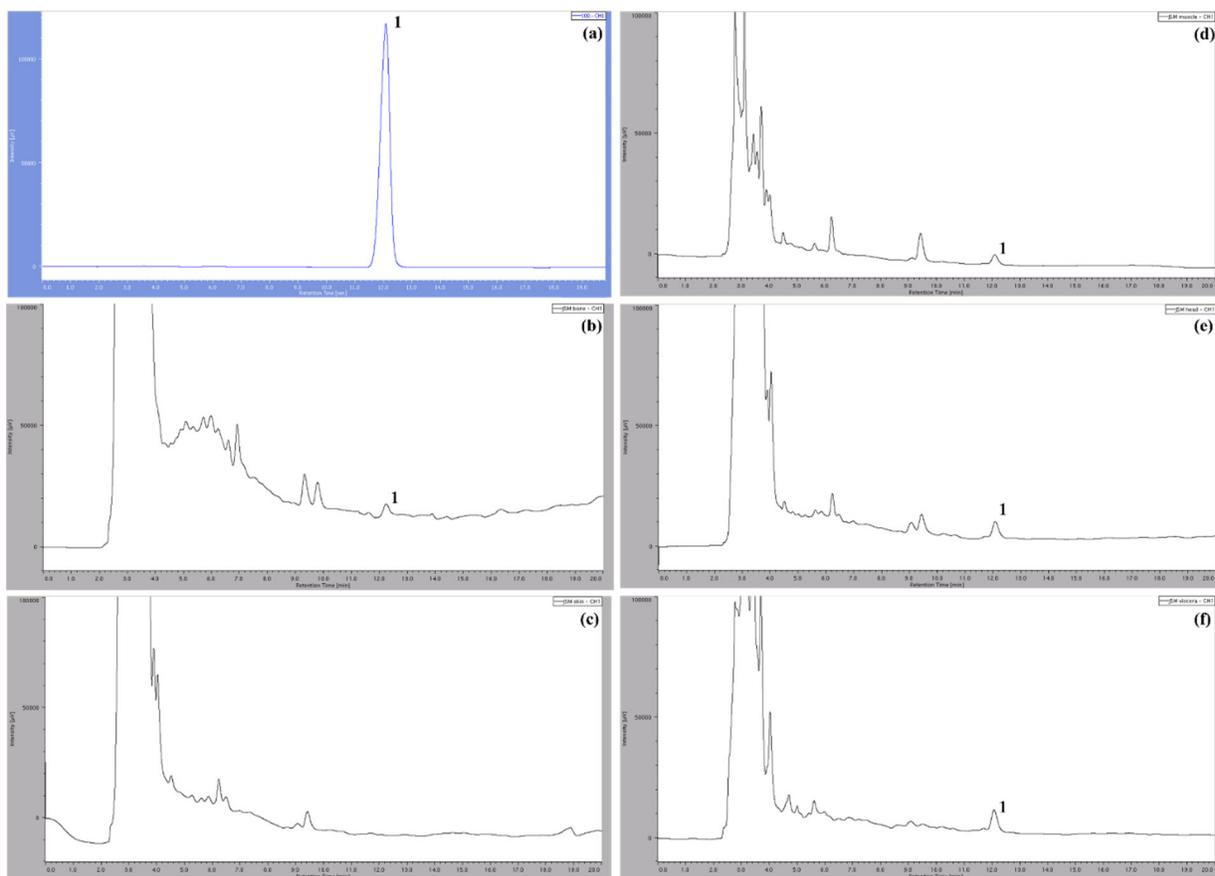
# Lipid Indexes and Quality Evaluation of Omega-3 Rich Oil from the Waste of Japanese Spanish Mackerel Extracted by Supercritical CO<sub>2</sub>

## Supplementary File



**Figure S1.** A schematic diagram of SC-CO<sub>2</sub> extraction process.

(1: CO<sub>2</sub> tank, 2: Pressure gauge, 3: Cooling bath, 4: Safety valve, 5: Main pump, 6: Electric indicator, 7: Pressure indicator, 8: Heat exchanger, 9: BPR valve, 10: Separator, 11: Sample collector, 12: Gas flow meter)



**Figure S2.** HPLC chromatograms of vitamin D (1) of standards and samples (vitamin D standard (a), bone oil (b), skin oil (c), muscle oil (d), head oil (e), and viscera oil (f))

**Table S1.** Proximate compositions of JSM raw materials

	Skin	Muscle	Bone	Head	Belly	Others
Body percentage	8.61 ± 0.34 <sup>d</sup>	50.89 ± 0.30 <sup>a</sup>	7.91 ± 0.14 <sup>e</sup>	16.03 ± 0.17 <sup>b</sup>	6.22 ± 0.22 <sup>f</sup>	9.96 ± 0.13 <sup>c</sup>
Moisture	2.28 ± 0.17 <sup>d</sup>	11.96 ± 0.51 <sup>a</sup>	2.42 ± 0.41 <sup>d</sup>	3.87 ± 0.25 <sup>c</sup>	11.09 ± 0.73 <sup>b</sup>	-
Lipid	51.08 ± 0.01 <sup>a</sup>	30.24 ± 0.47 <sup>c</sup>	42.50 ± 1.03 <sup>b</sup>	42.27 ± 0.96 <sup>b</sup>	30.27 ± 1.08 <sup>c</sup>	-
Ash	4.78 ± 0.06 <sup>d</sup>	6.87 ± 0.37 <sup>c</sup>	9.19 ± 0.59 <sup>a</sup>	9.09 ± 0.49 <sup>b</sup>	4.43 ± 0.74 <sup>d</sup>	-
Protein	40.12 ± 0.27 <sup>e</sup>	49.14 ± 0.44 <sup>b</sup>	45.52 ± 0.34 <sup>c</sup>	44.39 ± 0.40 <sup>d</sup>	52.17 ± 0.36 <sup>a</sup>	-

±, indicates the standard deviation from the mean; different superscripts indicate the significant differences ( $P < 0.05$ )

**Table S2.** Gas chromatography operating conditions for fatty acid analysis of anchovy oils and commercial oils

Parameters	Conditions
Instrument	Agilent 6890N GC System
Split	Splitless
Inject Temperature	250 °C
Carrier Gas & Flow Rate	He, 0.5 mL/min
Oven Condition	140 °C (5 min) → 4 °C/min for 25 min → 240°C (17 min)
Detect Temperature	260 °C
Column	Supelco sp. 2560, capillary column Fused silica Capillary 100.0 m × 250 μm × 0.2 μm film thickness