

Characterization of Micro-components and their Effect on Oxidative Stability of Avocado Oil Extracted with Supercritical Carbon Dioxide

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Avocado oil was extracted from horticulturally mature ripe and unripe fruit with supercritical carbon dioxide (SC-CO₂). The fruit were either freeze-dried or oven-dried at 80°C prior to oil extraction. For each treatment, the oil was divided into four fractions with progressive extraction and analysed for chlorophyll, carotenoid, tocopherol and sterol contents, peroxide value (PV), free fatty acid value (FFA), anisidine value (AV) and oxidative stability index (OSI). The third (78.04 – 210.03 mg pheophytin/kg) and fourth (249.13 – 394.42 mg pheophytin/kg) oil fractions had higher levels of chlorophyll than the first two fractions (23 – 58 mg pheophytin/kg). There was a progressive increase in carotenoid content from the first (6.67 – 15.53 mg/kg) to the last fractions (34.22 – 70.51 mg/kg). Levels of total tocopherols (117.9 – 405.8 mg/kg), total sterols (3277.5 – 4373.2 mg/kg) and their isomers did not show any specific trends with progressive extraction. No trend was observed for the PV and AV although total oxidation levels (TOTOX) were higher on average for oil extracted from oven dried fruit (38.61) than freeze dried fruit (32.72). The FFA decreased with progressive extraction (1.41 – 0.56 from fraction one to four). The OSI increased during extraction, ranging from 1.08 – 3.04 h in the first fractions to 9.28 – 21.55 h in the fourth. The OSI correlated positively with chlorophyll (0.83), carotenoids (0.80) and AV (0.56) and negatively with the FFA value (-0.69). Multiple regression models indicated chlorophyll as the most important variable in predicting the OSI of the avocado oil.