

Sterilization and extraction of palm oil from screw pressed palm fruit fiber using supercritical carbon dioxide

ABSTRACT

The supercritical carbon dioxide (SC-CO₂) was successfully used in the complete sterilization as well as simultaneous extraction of oil from screw pressed palm fruit fiber. The studies were conducted at different temperatures (40, 50, 70 °C) and pressures (13.7, 20.7 MPa) for 60 min of extraction period. The bacteria, gram negative (*Bacillus*), present in the sample was completely killed at 20.7 MPa and 50 °C. Palmitic and oleic acid were found to be the major fatty acids in extracted oil. More saturated fatty acid were extracted at 50 °C and lower operating pressure (13.7 MPa). The unsaturated components, such as linoleic and oleic acids were extracted at higher pressures of 27.6 and 34.5 MPa, respectively. The fatty acids composition of the extracted oil analyzed using gas chromatography–mass spectrometry (GC/MS) includes caprylic, capric, lauric, myristic, palmitic, margaric, stearic, oleic, linoleic, linolenic, arachidic and gadoleic acids.

Keyword: Supercritical-CO₂; Sterilization; Extraction; Fatty acids; Residual-palm-oil