

# Waterless sterilization of oil palm fruitlets using supercritical carbon dioxide

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## Abstract

Conventionally, oil palm fruits (OPF) are sterilized using steam which generates huge amount of palm oil mill effluent (POME). This study focuses on inactivating the lipase-producing microbes (LPM) in OPF using supercritical carbon dioxide (SC-CO<sub>2</sub>), thus preventing formation of free fatty acids. Pressure, temperature and sterilization time were studied for optimum sterilization conditions by measuring the reduction of microbes before and after treatment of OPF using SC-CO<sub>2</sub> and autoclave. Sterilizing OPF with SC-CO<sub>2</sub> resulted in major changes in the physical, fruit surface and texture when compared to autoclave. The optimum parameters for complete microbe inactivation were pressure "10MPa" temperature "80°C" and sterilization time "60min". The findings reveal that the SC-CO<sub>2</sub> could be a potential technique to inactivate the LPM in OPF. POME generation from the palm oil mills could be put to an end by replacing the steam sterilization technology with moderate temperature and pressure of SC-CO<sub>2</sub>. © 2017.

**Keywords:** Oil palm fruitlets; Supercritical carbon dioxide (SC-CO<sub>2</sub>); Supercritical pressure; Waterless sterilization

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