

Title Effect of oxygen absorber, nitrogen flushing, packaging material oxygen transmission rate and storage conditions on quality retention of raw whole unpeeled almond kernels (*Prunus dulcis*)

Author S.F. Mexis and M.G. Kontominas

Citation LWT - Food Science and Technology, Volume 43, Issue 1, January 2010, Pages 1-11

Keywords Raw unpeeled almonds; Active packaging; Nitrogen flushing; Oxygen absorber; Shelf-life extension; Quality

Abstract

The present study investigated the effect of active packaging, nitrogen flushing, container oxygen barrier and storage conditions on quality retention of raw whole unpeeled almonds. Almond kernels were packaged in: a) polyethylene terephthalate//low-density polyethylene (PET//LDPE), and b) low-density polyethylene/ethylene vinyl alcohol/low-density polyethylene (LDPE/EVOH/LDPE) pouches under N₂ with or without an oxygen absorber, heat-sealed and stored for a period of 12 months. Quality parameters monitored were: peroxide value (PV), hexanal content, color, fatty acid composition and volatile compounds. PV ranged between 0.17 for fresh almonds and 9.22 meq O₂/kg oil for almonds packaged in PET//LDPE pouches under N₂ exposed to light at 20 °C after 12 months of storage. Respective values for hexanal were <28.5 µg/kg and 4.88 mg/kg. Polyunsaturated fatty acids (PUFA) and saturated fatty acids (SFA) increased with a parallel decrease of monounsaturated fatty acids (MFA) after 12 months of storage in all treatments. Likewise, volatile compounds such as aldehydes, ketones, alcohols, alkanes and aromatic hydrocarbons increased indicating enhanced lipid oxidation. Color was the parameter least affected. Use of the oxygen absorber provided a shelf life of at least 12 months for all samples irrespective of container oxygen barrier, lighting conditions and storage temperature.