

Abstract

Peanuts, pork scratchings, oatmeal and two types of muesli were stored in two experiments, where external factors (light, oxygen concentrations, product-headspace ratios) were varied, and where packaging materials with different properties (light transmission and oxygen permeability) were used. The oxidative changes in the products were followed by the formation of hexanal as detected by headspace gas chromatography (headspace-GC), free radicals as detected by electron spin resonance (ESR) spectroscopy and sensory evaluations. Generally, increased oxygen availability and exposure to light resulted in increased lipid oxidation. Statistical analysis of the results revealed that light accounted for the greatest systematic variation of the relative levels of free radicals in peanuts, oatmeal and muesli, whereas the oxygen availability had the largest influence on the formation of hexanal. The opposite was observed for pork scratchings, where oxygen had the most significant effect on the formation of radicals. It is concluded that ESR and headspace-GC complement each other in detecting the oxidative changes.