

Title Effects of package atmosphere and temperature on phenolics, total antioxidant capacity and colour in kernels of 'Franquette' walnuts during 8-month storage

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Abstract

The effects of package atmosphere and temperature on phenolic compounds, total antioxidant capacity and colour were investigated in kernels of 'Franquette' walnuts stored for up to 8 months. Dried walnuts were sealed under air or 100% N₂ and stored at 1°C or 20°C. The highest total phenolics concentration (25.41 mg gallic acid equivalents g⁻¹) and total antioxidant capacity (185.6 μmol trolox equivalents g⁻¹, and 174.2 μmol trolox equivalents g⁻¹ according to FRAP and DPPH method, respectively) were observed in samples before storage. The above parameters decreased progressively during storage. Low temperature and N₂-atmosphere inhibited decline while their combination provided best preservation of nutritional value. Additive effects of low temperature and N₂-atmosphere were also observed in retention of L* and hue angle colour parameters while Chroma was affected only by temperature. Major phenolic compounds were ellagic, protocatechuic, vanillic, and syringic acids and found at concentrations of 822.4 μg g⁻¹, 581.8 μg g⁻¹, 581.6 μg g⁻¹, and 310.2 μg g⁻¹, respectively. At the end of storage all phenolic compounds decreased and the decrease was most pronounced in air at 20°C (54% of all compounds, in average) and less in N₂-atmosphere at 1°C (18% of all compounds, in average).