

**Title** Prediction of crude sunflower oil deterioration after seed drying and storage processes  
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### Abstract

The effects of air-drying temperature and storage time on several characteristics of crude sunflower oil were evaluated in terms of FFA and PV. Long storage affected oil content to a greater extent than air-drying temperature. FFA and PV varied between 0.53 and 1.22% and between 10.7 and 23.3. meq O<sub>2</sub>/kg, respectively, when samples of uniform initial moisture content (approximately 28%) were dried at various temperatures between 25 and 90°C to approximately 7% moisture content, stored for 8 mon, and then analyzed. Both oil quality characteristics increased exponentially with air-drying temperature ( $T$ ) and linearly with storage time ( $t$ ). Mathematical functions of the form  $A \cdot \exp(B \cdot T) + C \cdot t$  (where  $A$ ,  $B$ , and  $C$  are parameters adjusted from experimental data) most closely predicted the experimental loss of quality of sunflower oil in terms of FFA and PV with variations in  $T$  and  $t$ . Statistical analysis showed SE of the estimated parameters of 0.08 and 1.19 and coefficients of determination,  $R^2$ , of 0.922 and 0.939 for FFA and PV, respectively, which were significant at 95% confidence. High-oleic seeds from a similar experiment were used to validate the proposed equation. The results of applying the mathematical function proposed above showed a reasonable ability to predict the experimental values with SE of 0.037 and 0.808 and  $R^2$  of 0.983 and 0.972 for FFA and PV, respectively, which were significant at 95% confidence. Plots of residuals showed random distribution. The results obtained suggested that the equation proposed could be used as a quality-loss model in sunflower drying simulations.