

## **Influence of UV radiation on natural and synthetic antioxidants and unsaturated fatty acids in evening primrose oil**

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The aim of the study was to assess the impact of UV radiation and antioxidants on unsaturated fatty acids, conjugated fatty acids and tocopherols in a model system. The model system consisted of stripped cold-pressed evening primrose oil into which the antioxidants BHT and TBHQ at 600 ppm concentration were added. The oil samples were irradiated with a xenon 150W lamp through UV-absorbing filters. During 20-hour radiation samples were taken every 3 hours and the peroxide value (PV) was determined and the absorption and fluorescence spectrum in n-hexane were measured. During irradiation of oil samples without BHT and TBHQ, the absorption spectrum was changing within the absorption bands of dienes (234 nm), trienes (268 nm), tetraenes (303 nm) and tocopherols. Simultaneously, the peroxide value was increasing, which indicated the oxidation of unsaturated fatty acids and conjugated fatty acids. The addition of BHT reduced the increase in oxidized diene absorption band and the decrease in the fluorescence intensity of tocopherols band. This suggested that the loss of tocopherols with BHT was smaller. These observations confirmed the smaller increase in the peroxide value. The addition of TBHQ virtually stopped the changes in the absorption and fluorescence spectrum of tocopherols and unsaturated fatty acids and did not influence the changes in the spectrum of trienes and tetraenes. The radiation of samples in the antioxidant absorption band did not modify their spectra. It may be concluded that despite irradiation, the concentration of BHT and TBHQ during the experiment remained unchanged. The results suggest that the addition of BHT and TBHQ did not inhibit the oxidation of trienes and tetraenes but inhibited the oxidation of unconjugated, unsaturated fatty acids. This addition stabilized tocopherols which resulted in the prolongation of the induction of oxidation to over 20 hours.