

# The Effect of the Refinery Steps to Tocopherol Content in Cotton Seed Oil

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Crude vegetable oils contain a variety of minor components, such as hydrocarbons, sterols, tocopherols, polyphenols, colour compounds and trace metals. The refining process removes or reduces the contaminants of the crude oil that could potentially affect the quality of the end product and the efficiency of lipid modification. The lipid molecules undergo different chemical reactions during process from their raw sources to the storage. Chemical changes of lipids occurring during processing are numerous and can be desirable, undesirable, of questionable consequence, or a combination thereof. This unwanted result is away of  $\alpha$ -tocopherol.

Natural tocopherols and tocotrienols are retained at considerable levels in finished refined vegetable oils. Since they are relatively thermal-resistant, so that only modest tocopherol losses are registered during deodorization/distillation phase (carried out at 220–260°C) their natural antioxidant activity should protect the refined oils against thermal oxidation. At normal oxygen pressure the major lipid radical is the peroxy radical (ROO.) which can be converted to a hydroperoxide (ROOH) by an electron donor. Tocopherols act as antioxidants by donating hydrogen from their phenolic group to radicals to stabilise them and stop the propagation phase of the oxidative chain reaction.

In this study,  $\alpha$ -tocopherol isomers in cotton seed oil was separated by Agilent 1200 Series HPLC and measured fluoremetrically using a fluorescence detector with a xenon discharge lamp (Ex 295 nm, Em 330 nm) and a Agilent Quaternary pump. A LiChrosorb SI60 (5  $\mu$ m) column (4 mm i.d., 250 mm) was used with %48 MeCN- %48 Methanol- %4 Water (containing 0.2 mL phosphoric acid) as the mobile phase moving at the rate of 1.5 mL/min. An adequate volume of cotton seed oil sample (1 g) taken from each refining steps were dissolved in 10 mL acetone and injected directly.

Results obtained from experiments showed that tocopherol content changed depending on the several factors such as temperature, adsorbent dosage, vacuum, time and refining conditions in cotton seed oil refining process. Especially it was observed that tocopherol content was decreased markedly in bleaching and deodorization steps applied high temperature and high vacuum compare to other refining process steps.

## REFERENCES

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