Effects of Cultivar and Refining on Oxidative Stability of Camelina Oil

Deirdre Ni Eidhin, David O'Beirne, University of Limerick, Ireland.

Camelina sativa is an interesting oilseed crop as the oil contains higher levels of α-linolenic acid (35-40 %, C18:3ω3, ALA), an essential omega-3 (ω3) fatty acid, than commonly used food oils. It is a potentially important functional food ingredient providing beneficial omega-3 fatty acids without the chemical instability problems associated with fish oils. In this study, effects of cultivar and refining on oxidative stability of camelina oil were compared.

Oxidative stability was evaluated by peroxide value (PV), thiobarbituric acid reactive substances (TBARS), ρ-anisidine value (AnV), conjugated dienes (CD) and trienes (CT) during storage at 65 °C for 16 days.

Spring camelina oil had higher ($p<0.05$) PV, AV and Totox values from Day 5-16 and significantly higher TBARS (Day 2-16) than Winter camelina oil and had significantly lower CD (Day 10-14) and CT (Day 5-16). Cold pressed camelina oil had lower ($p<0.05$) PV, AV, Totox, TBARS, CD and CT values than refined camelina oil throughout storage at 65 °C.

The effects of refining (alkali refined and deodorized) on stability of camelina oil were much greater than cultivar effects. Differences in fatty acid profiles, particularly ALA content, cannot account for these differences in oxidative stability as Winter, Spring, cold-pressed and refined camelina oils contained 40.2 %, 37.7 %, 38.9 % and 38.2 % ALA respectively. Instead, differences in amounts of naturally occurring antioxidants such as tocopherols and tocotrienols may account for the effects observed.