OILS/FATS (incl. Edible oils, Butter)

NPARR 4(1), 2013-057 Antioxidant activity of sesamin in canola oil

The present study presents the antioxidant activity of sesamin in canola oil compared with that of butylated hydroxytoluene (BHT) by monitoring the oxygen consumption and the decrease in linoleic acid and α-linolenic acid. The oxidation of canola oil was conducted at 35, 60, 90, 120 and 180°C with addition of 50-400 ppm sesamin. Results from the oxygen consumption test showed that sesamin dose-dependently inhibited the oxidation of canola oil at concentrations of 50-200 ppm at temperatures of 60-180°C, however, sesamin lost its antioxidant activity at a low temperature of 35°C. The fatty acid analysis also demonstrated that sesamin at 50, 100 and 200 ppm dose-dependently prevented the oxidation of linoleic acid and α-linolenic acid in canola oil. Both the oxygen consumption and the fatty acid analysis demonstrated sesamin was less effective than BHT as an antioxidant at temperatures of 60-180°C. It was therefore concluded that sesamin could prevent the lipid oxidation of frying fats and oil, however, its antioxidant activity was not as potent as that of BHT [Si, W.*, Xie, P.F., Ma, K.Y., Liang, Y, Wang, X.B., Chung, H.Y. and Chen, Z.-Y. (Suzhou Polytechnic Institute of Agriculture, Suzhou, Jiangsu, China), JAOCS, Journal of the American Oil Chemists' Society, 2013, 90(4), 511-516].

NPARR 4(1), 2013-059 Health effects of olive oil polyphenols: Recent advances and possibilities for the use of health claims (Review)

The Mediterranean diet and consumption of olive oil have been connected in several studies with longevity and a reduced risk of morbidity and mortality. Lifestyle, such as regular physical activity, a healthy diet, and the existing social cohesion in Southern European countries have been recognized as candidate protective factors that may explain the Mediterranean Paradox. Along with some other characteristics of the Mediterranean diet, the use of olive oil as the main source of fat is common in Southern European countries. The benefits of consuming olive oil have been known since antiquity and were traditionally attributed to its high content in oleic acid. However, it is now well established that these effects must also be attributed to the phenolic fraction of olive oil with its antioxidant, anti-inflammatory and anti-microbial activities. The mechanisms of these activities are varied and probably interconnected. For some activities of olive oil phenolic compounds, the evidence is already strong enough to enable the legal use of health claims on foods. This review discusses the health effects of olive oil phenols along with the possibilities of communicating these effects

NPARR 4(1), 2013-060 Seed oil and fatty acid composition in *Capsicum* spp.

The oil content and fatty acid composition of seed of 233 genebank accessions (total) of nine *Capsicum* species, and a single accession of *Tubocapsicum anomalum*, were determined. The physicochemical characteristics of oil extracted from seed of *Capsicum annuum* and *Capsicum baccatum* were also examined. Significant differences among mean values for seed oil content were detected among the cultivated *Capsicum* species. Oil content in seed of *C. annuum var. annuum* was significantly greater than that in seed of other cultivated species. *Capsicum pubescens* had the lowest average seed oil content. Among the non-cultivated taxa examined, seed of *Capsicum galapagoense* had the lowest oil content and *T. anomalum* the highest. Averages across the 5 cultivated taxa for the 4 principal fatty acids were 12.9%, 3.4%, 6.7% and 76.0% for C16:0 (palmitic), C18:0 (stearic), C18:1 (oleic) and C18:2 (linoleic), respectively. Linoleic acid was the principal fatty acid in all samples, with a high value of 81% in *Capsicum chinense*. *Capsicum frutescens* had the lowest percentage of total unsaturated fatty acids and *T. anomalum* the highest. In general, the oil content and fatty acid composition of seed of the wild taxa were similar to those of the cultivated species [Jarret, R.L.*, Levy, I.J., Potter, T.L., Cermak, S.C. (USDA, ARS, PGRU, 1109 Experiment Street, Griffin, GA 30224, United States), *Journal of Food Composition and Analysis*, 2013, 30(2), 102-108].

NPARR 4(1), 2013-061 Sitosterol as an antioxidant in frying oils

The antioxidative effect of sitosterol at 1, 2 and 5% levels, in triolein, refined canola, high oleic sunflower and flaxseed oils, continuously heated for a period of up to 72 h at frying temperature of 180 °C, was studied. High Pressure Size Exclusion Chromatography (HPSEC) was used to monitor changes in peak areas of triacylglycerol (TG) polymer, monomer and ester hydrolysis products. The presence of enhanced levels of sitosterol was found to significantly decrease TG polymer formation in triolein and the vegetable oil samples after heating at 180°C for a period of 72 h. A corresponding increase in the level of intact TG monomer and the extent of TG ester hydrolysis was observed in all samples with enhanced levels of sitosterol. Conversion of sterol to steradiene, by the 1, 2 elimination of water, may be responsible for the antioxidative effect of sitosterol at frying temperatures [Singh, A. (Department of Agricultural, Food and Nutritional Science, University of Alberta, 410 Agriculture/Forestry Centre, Edmonton, AB T6G 2P5, Canada), *Food Chemistry*, 2013, 137(1-4), 62-67].

NPARR 4(1), 2013-062 Potential use of extra virgin olive oil in bakery products rich in fats: A comparative study with refined oils

The lipid fraction of bakery products undergoes a significant degradation during baking, with an increase in undesirable oxidised substances that can act as catalysts for further oxidative reactions during storage reducing the product shelf life. The use of extra virgin olive oil in bakery products rich in fat in place of refined oils was studied, assessing the evolution of the oxidative and hydrolytic degradation during storage. Two-way analysis of variance, followed by Tukey's HSD test for multiple comparisons, covariance and principal component analyses were carried out to compare the effect of the type of oils. The data obtained showed that the
evolution of the oxidation levels in the analysed samples during storage was related to the type of oil used in the production process. Particularly, the use of extra virgin olive oil led to significantly lower values of hydroperoxides, ultraviolet absorption constants, triacylglycerol oligopolymers and oxidised triacylglycerols [Caponio, F., Giarnetti, M., Paradiso, V.M., Summo, C., Gomes, T. (Dipartimento di Scienze del Suolo, Della Pianta e degli Alimenti (DISSPA), Università degli Studi di Bari Aldo Moro, Via Amendola, 165/a, I-70126 Bari, Italy), *International Journal of Food Science and Technology*, 2013, **48**(1), 82-88].