102/B

Trans fatty acid formation in vegetable oils during repeated heating

B W N Balasuriya[1], H P P S Somasiri[2] and W M T Madhujith[1]*
[1]Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya, Peradeniya 20400
[2]Industrial Technology Institute, Bauddhaloka Mawatha, Colombo 7

Trans fatty acid formation during repeated heating of vegetable oils has become a food safety concern today. Due to the negative impact of *trans* fatty acids on human health, investigation of *trans* fatty acid formation during repeated heating of vegetable oils is of great importance. The objective of this study was to assess the effect of repetitive heating of vegetable oils on formation of *trans* fatty acids. Vegetable oils, namely soy oil, palm olein and virgin coconut oil were heated at different temperatures (180 ºC, 200 ºC, and 220 ºC) for 20 min for five days successively with one heating cycle per day. The heating experiment was repeated without controlling the temperature. Oil samples (60 ml) were withdrawn after each heating cycle and analyzed for the *trans* fatty acid content by Gas Chromatograph.

The amount of *trans* fatty acids contained in the original soy oil, palm olein and virgin coconut oil samples were 3.3%, 0.3% and 0% respectively. After five days of continuous heating the *trans* fatty acid contents was not significantly ($p>0.05$) different in all three oil samples heated at 180 ºC, 200 ºC and 220 ºC. However the samples heated without controlling the temperature showed a sharp increase in *trans* fatty acid contents. The *trans* fatty acid contents of soy oil, palm olein and virgin coconut oil heated without controlling the temperature were 10.7%, 2.2% and 0.3% respectively. The least alterations to the *trans* fatty acid content was observed in virgin coconut oil sample.

The changes in *trans* fatty acid formation depended on the temperature used in repeated heating. Repeated heating appear safe under temperature conditions lower than 220 ºC, in relation to *trans* fatty acid formation. Moreover, minimizing the number of cycles of repeated frying less than five cycles would be a better approach in deep frying irrespective of the oil used.

*nilee6059@yahoo.com Tel: 081-2390000