DST funded study cautions on recycling used oil

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If you are in the habit of frying in large utensils with a ógoodô amount of oil and preserving the left over for using it to refry, there is an urgent need to revisit the practice. A Department of Science and Technology funded research carried out by Diabetes Foundation (India) and IIT Delhi has warned that the óleft overô oil should not be used for re-frying as it has a high trans fatty acid content.

Deep-frying is a popular method of food preparation globally especially in India wherein the food is cooked in hot fat/oil, deep enough to cover the food. It has been traditionally been a part of all Indian kitchens for enhancing the flavour and taste.

The research accepted for publication in Food Chemistry has cautioned people to refrain from recycling the left- over oil for deep frying . The samples of olive oil, soyabean oil and groundnut oil which had no visible levels of trans fats displayed significant trans fat levels when these oils were reheated for frying at temperatures above 180 degrees C.

ñThe study highlights the formation of TFA in edible refined oils on heating/frying with an experimental design closely formulated on the basis of deep-fat frying practices adopted at commercial and household levels,ò says Dr. Swati Bhardwaj, senior nutrition researcher at the New Delhi-based Diabetes Foundation (India).

Bharadwaj and her collaborators from the All India Institute of Medical Sciences, the Indian Institute of Technology Delhi and the Institute of Home Economics underlined how the chemical composition of cooking oils change with reheating and frying again.

Dr. Anoop Misra, Chairman Fortis C-DOC, one of the lead researchers in the study said that this was an important finding as many households and commercial vendors tend to recycle the used oil for frying.

Prof. K.K. Pant (IIT Delhi) lead researcher in the study highlighted the ñQuality control of trans fatty acids using proper instrument and checking of oils for TFA in commercial outlets especially fast food outlets should be part of regulatory environment in food safetyò.

Dr. S.J. Passi (former director institute of home Economic) also highlighted that ñSubjecting fats/oils to high temperatures during frying leads to the formation of trans fats which pose serious health hazards. During frying, avoid fat/oil abuse and use the leftover fat/oil.ò

The Research

There are a wide variety of fats/oils used in India, therefore to identify the most commonly used fats/oils (for frying), a survey was carried out among 402 female respondents and 42 commercial

food establishments [including restaurants, fast food joints (both Indian and western), and road side vendors). Thereafter six different types of fats/oils commonly used in north India were selected for the study; refined soybean oil (RSO), refined groundnut oil (RGO), refined olive oil (ROO), refined rapeseed oil (RRO), Clarified butter (CB; ghee) and partially hydrogenated vegetable oil (PHVO; vanaspati). For each fat/oil three different samples were used for analysis. All the analysis was conducted in duplicates. Further, to study the formation of TFA in fats/oils during heating/reheating and frying in heated/re-heated fats/oils,two temperatures, each representing a lower (180ºC) and a higher (220ºC) temperature range were selected based on previous studies.
For each fat/oil sample, a karahi (a thick, circular, and deep cooking pot, similar in shape to a wok, used for open air deep frying) containing 500 ml of the fat/oil sample was taken. The fat/oil temperature was recorded and heating was initiated till the temperature of the fat/oil reached 180ºC. The temperature of fat/oil was maintained at 180ºC for 30 minutes, thereafter, 30 ml of oil was drawn in clean and pre-dried, pre-coded glass bottles and stored in cool box. The subsequent heating cycle was performed in the same fat/oil sample by continuing heating and maintaining the sample for half an hour at 220ºC, and then it was allowed to cool for a period of 60 minutes. Subsequently, the same sample was re-heated, and the entire process was repeated.

Results

The results demonstrated that fats/oils subjected to high temperature heating/re-heating show high levels of TFA and SFA at the cost of cis-UFA, which is nutritionally undesirable. Suitable guidelines should be developed in India to stop the practice of re-using the same fat/oil and maintaining a specific temperature during frying in not only in large scale commercial establishments but also at the small scale.

What are trans fatty acids?

Trans fatty acids (TFAs) are the most important type of ôbad fatsô in diet, and have much more adverse effects on body than any other dietary constituent. Artificial TFAs are made when hydrogen gas is made to react with oil, to form hard fats. They are also formed in repeatedly re-heated and re-used oils. Major source of artificial TFAs in our diet are the partially hydrogenated vegetable oils (PHVO), the most common example in India is *Vanaspati* and margarine. Small amount of TFAs are naturally present in dairy foods and animal products. TFAs pose a higher risk of heart disease than posed by saturated fats. While saturated fats raise total cholesterol levels, TFAs not only raise total cholesterol levels but also reduce the good cholesterol (HDL), which helps protect against heart disease. Examples of Food Items Containing Artificial Trans Fats include *Bhatura, Puri, Samosa,* Fried *aloo chaat, Halwa, Aloo tikki, Mathi, namakpara, Kachori,* Fried *Namkeens, P*atty, French fries, cake, pastry, cookies, Pizza, Rusk etc.