

Evaluation of an Optimised Oil in Deep-frying Process

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Optim'oils is an european project (FP6-FOOD 36318, www.optimoils.com) which aims to produce new vegetable oils (e.g. sunflower) with a higher nutritional value and a better stability. These "optim'oils", richer in micro-constituents as tocopherols and phenolic compounds than classical reference refined oils, are obtained by optimising conditions of crushing and refining. Among them, Optim Sun is produced by specific conditions of mechanical crushing and soft-refining.

The capacity of this optimised oil to be used in deep-frying of potatoes is evaluated and compared with a commercial sunflower oil (Traditional Sun) and a rapeseed oil (Traditional Rap) produced by hexane extraction and classical refining. 8 cycles of frying of 12 minutes (in 4 days) are carried out in a domestic fryer at 180 °C, with a ratio mass potatoes/ volume oil of 0.5 (kg/L). The behaviour of the oil during frying is assessed by measuring markers of lipid thermo-oxidation (conjugated dienes, polar compounds and polymers) and antioxidant levels (tocopherols and phenolic compounds).

After 8 cycles of frying, the increase of conjugated dienes is similar for Optim Sun and Traditional Sun (about 25 %), but lower than for Traditional Rap (39 %). After frying, the polymerisation level of Optim Sun and Traditional Rap is higher than for Traditional Sun but the formation of polar compounds is lower with less than 5 % of total polar compounds. These results point out the ability of this sunflower optimised oil to be used in deep-frying application. Moreover, a large part of initial antioxidants still remain in this optim'oil after frying, i.e. 60 % of initial tocopherols and 70 % for phenolic compounds. However, the organoleptic characteristics of such oil will have to be optimised in order to expand its use in deep-frying.