

Comparison of the Effects of Dietary Fats Based on Rapeseed Oil and Sunflower Oil in Healthy Subjects

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Dietary fats and oils based on rapeseed oil, which contains a low proportion of saturated fat, a large amount of oleic acid and a relatively high proportion of α -linolenic acid (18:3 n-3) are interesting alternatives to commonly used dietary fats and oils with a high content of linoleic acid (18:2 n-6). The present double-blind cross-over study comprised two 3-week treatment periods interfoliated by a wash-out period of two to three weeks. It was carried out in randomized order at four different boarding schools. The investigation was performed in two schools in the autumn and two schools during the spring. 94 persons took part in the study. The dietary fats used in the kitchen for cooking and as spread on the bread were during one period prepared from rapeseed oil (RO) and during the other from sunflower oil rich in linoleic acid (LO). No changes were made with regard to the total fat content or other nutrients during the study. The menu comprising ordinary foodstuffs was identical during both periods. During the investigation the participants were only allowed to eat food which was prepared in the school kitchen with the exception of small amounts of specified low fat food according to a certain list.

Laboratory tests were performed at the end of each treatment period. The dietary fat composition was monitored with a double-portion technique.

During both treatment periods the serum cholesterol (-4%, $p < 0.001$), the LDL cholesterol (-5% - -7%, $p < 0.01$ and $p < 0.001$) and the apolipoprotein B (-5%, $p < 0.001$) concentrations decreased significantly and to the same extent. The serum triglyceride concentrations and HDL cholesterol, apolipoprotein A-I and Lp(a) remained virtually unchanged. The content of linoleic acid in the serum phospholipids increased considerably after the LO-fat while the contents of α -linolenic acid and eicosapentaenoic acid (20:5 n-3) were elevated after the RO fat. The concentration of α -tocopherol increased and that of γ -tocopherol decreased after the LO-fat period. These changes were significantly less pronounced after the RO fat.

In conclusion this study indicates that a change in fat quality only, while all other contents of the food are kept unchanged, causes a significant improvement of the lipoprotein profile in healthy subjects. The RO fat was as effective as the LO fat in this respect. It was also demonstrated that humans have a certain capacity to elongate and desaturate α -linolenic acid to eicosapentaenoic acid in vivo. The LO and RO fats affected the tocopherol concentrations in serum in different ways. The RO fat was preferred by the kitchen personnel due to better technical qualities, especially when used for frying.

The study indicates that dietary fats based on rapeseed oil seem to be attractive alternatives to the more commonly used oils and fats rich in linoleic acid.