

S01-11 Mercury, selenium, PCBs and fatty acids in fresh and canned fish on the

Slovenian market

Ana Miklavčič¹, Janja Tratnik¹, Antonija Zajc¹, Saša Volk¹, Janez Klavž¹, Viktor Kure², Mojca Zupanc¹, Vekoslava Stibilj¹, Ester Heath¹, Tomaž Polak², Božidar Žlender², Terezija Golob², Milena Horvat¹

1. Jozef Stefan Institute, Ljubljana, Slovenia

2. Biotechnical faculty, University of Ljubljana, Ljubljana, Slovenia

E-mail: ana.miklavcic@ijs.si

Although fish are an important source of essential nutrients, they are also a source of pollutants such as mercury (Hg) and polychlorinated biphenyls (PCBs). Hg, PCBs, selenium (Se) and n-3 fatty acids were determined in fresh and canned fish samples from the Slovenian market. Based on the results of the study of the EU funded project PHIME, mercury exposure of pregnant women in Slovenia was also assessed. 52 fresh and 76 canned fish samples were bought on the Slovenian market. The analyses of total mercury (THg) and total selenium content (TSe) were performed in all the samples, while the analyses of fatty acid composition and PCBs were performed on 20 and 51 fish samples, respectively. THg was determined by chemical digestion and atomic absorption spectrometry using cold-vapor atomic absorption spectrometer (CVAAS). Chemical digestion and hydride generation atomic fluorescence spectrometry (HG-AFS) was used for TSe determination. For identification and quantification of n-3 acid we used the in situ transesterification method and gas chromatography-flame ionization detection (GC-FID). Seven “indicator polychlorinated biphenyls” (congeners 28, 52, 101, 118, 138, 153 and 180) were extracted by the Soxhlet method, lipids were removed by concentrated sulfuric acid and the florisil column was used for cleaning-up. The PCBs were identified and quantified by gas chromatography-electron capture detection (GC-ECD). The median values of important nutrients in fish were 471 ng/g for TSe and 259 mg/100g for n-3 fatty acid and the median values of pollutants were 100 ng/g for THg and 16,9 ng/g for PCBs. THg concentrations in fresh fish were significantly higher (Me=150 ng/g) compared to canned fish (Me=89 ng/g). Based on THg concentrations in hair of pregnant women (Me=306 ng/g) and fish consumption assessed by food frequency questionnaires, the linear regression correlation was calculated ($R=0,318$, $p < 0,001$). The weak correlation could be due to low THg concentrations in hair and high variability of THg concentrations in fish. The weakly dietary intake of MeHg, ingested by 95% of Slovenian pregnant women, calculated from THg concentrations in hair, does not exceed the current EPA reference dose. Based on the present study, it can be concluded that the levels of MeHg and PCBs in fish, consumed on average 1 - 3 times per month, do not represent a health risk and that fish are an important source of selenium and n-3 fatty acid.

Keywords: Mercury; Fish; Slovenian