PAH in Some Brands of Tea and Coffee - DTU Orbit (23/10/2019)

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The presence of 25 polycyclic aromatic hydrocarbons (PAHs) in tea and coffee were investigated with focus on four PAHs (PAH4), classified by the European Food Safety Authority (EFSA) as suitable indicators; benz[a]anthracene (BaA), chrysene (CHR), benzo[b]fluoranthene (BbF) and benzo[a]pyrene (BaP). PAH4 from samples of 18 brands of tea leaves and 13 brands of coffee were extracted by pressurized liquid extraction (PLE) followed by highly automated clean up steps for gel permeation chromatography (SX-3) and solid phase extraction (500mg silica). GC-MS were applied for detection of PAH4. The limit of detection (LOD) ranged from 0.1–0.3 μg/kg with recoveries from 94–106% for PAH4. Concentrations of PAH4 followed the pattern of the total sum of 25 PAHs with higher concentrations with a maximum of 115 μg/kg in tea leaves compared to 5.1 μg/kg in coffee. The highest PAH4 levels were found in black tea leaves. An additional 18 samples were used for estimation of transfer from solids to ready-to-drink preparations. Only up to 2% PAH4 were detected in the ready-to-drink tea, while for coffee the PAH4 transfer was up to 14%. The estimated exposure to PAH4 from tea infusions and coffee brew for the average Danish consumption is 29% of the total exposure to PAH4 for Danish consumers.