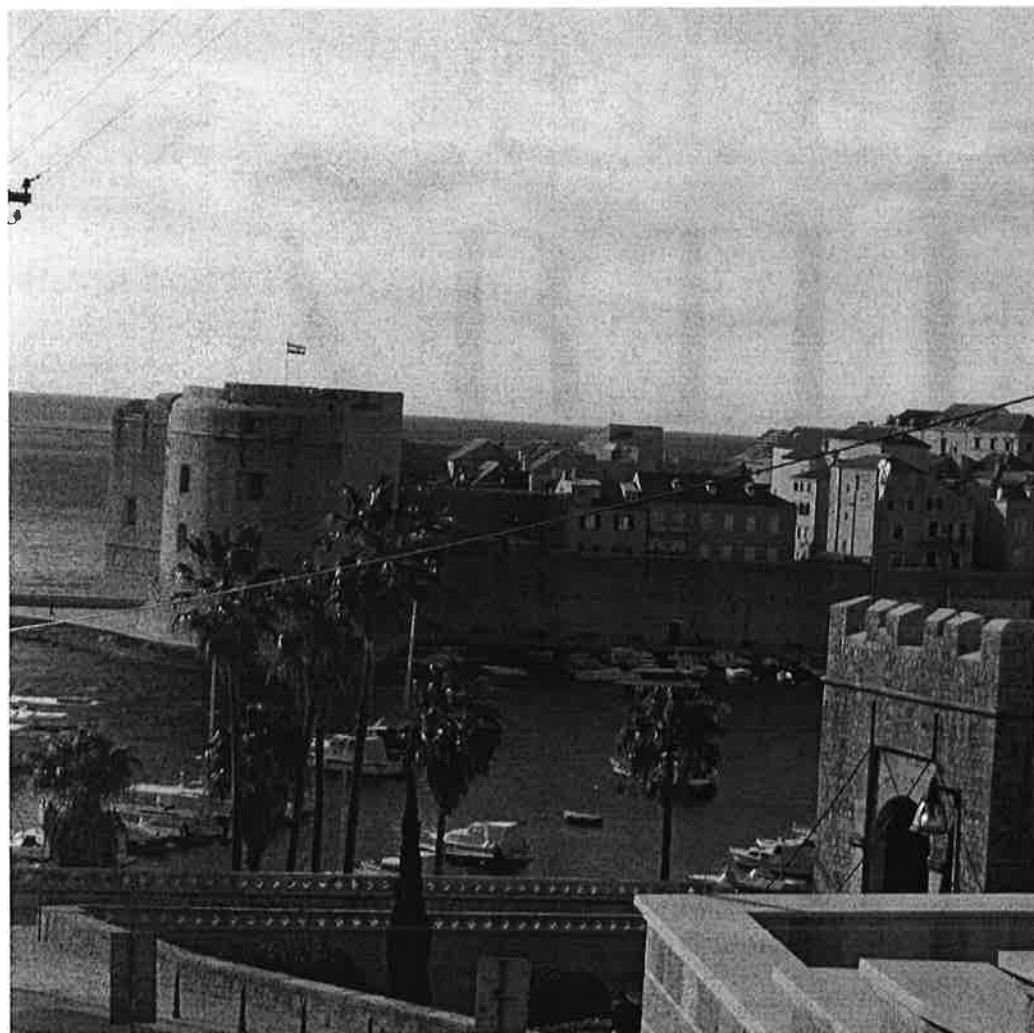


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“One Health”

9-12 November 2022

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Evaluation of polycyclic aromatic hydrocarbons in fermented dried sausages from the Serbian market

J. Djinić-Stojanović*, S. Janković, V. Djordjević, D. Nikolić-Perović, D. Vranić, I. Branković-Lazić, and N. Borjan

Institute of Meat Hygiene and Technology, Belgrade, Serbia

Polycyclic aromatic hydrocarbons (PAHs) are compounds that widely geographically distributed and remain in the environment for a long time. Meat and meat products may be contaminated by PAHs through the process of food smoking. This study provides original analytical data on the levels of benzo[a]pyrene and sum of PAH4 compounds [benzo[a]pyrene (BaP), benzo[a]anthracene (BaA), benzo[b]fluoranthene (BbF), and chrysene (CHR)] in different types of fermented dried sausages commonly consumed in Serbia. A total of 228 fermented dried sausages, collected from 2020 to 2021, were classified in 4 groups (kulen, cajna, sremska, and budimska sausage). Homogenized samples were extracted by acetonitrile. The purification procedure of the extract was based on the Quick Easy Cheap Effective Rugged and Safe (QuEChERS) approach. Levels of estimated PAH compounds were determined by gas chromatography-tandem mass spectrometry (GC-MS/MS). The following ranges were found ($\mu\text{g}/\text{kg}$): kulen ($n=56$): BaP $<0.2-0.5$, PAH4 $<0.2-2.5$; cajna ($n=103$): BaP $<0.2-1.0$, PAH4 $<0.2-8.6$; sremska ($n=37$): BaP $<0.2-0.4$, PAH4 $<0.2-3.4$; budimska ($n=32$): BaP $<0.2-0.3$, PAH4 $<0.2-1.4$. The maximum residue limits (MRL) for BaP and sum of PAH4 compounds, which were defined both by the legislation of Serbia and EU regulation, were not exceeded in the analysed samples and hence pose no risk to consumers.

KEY WORDS: budimska sausage; cajna sausage; kulen; PAH; sremska sausage

Elemental composition and health risk of hemp foods

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Bioaccumulation of harmful toxic elements is the intrinsic signature of the *Cannabis* species. When industrial cannabis (hemp) is used for food products, they have no market value if the elemental contamination is above the permissible level. Elemental composition (23 elements) of 46 hemp foods (20 oils, 9 protein, 12 seeds, 3 sweets, and 2 beverages) was obtained by inductively coupled plasma mass spectrometric (ICP-MS) analysis and further propagated into risk assessment for hemp foods consumers. Regarding non-carcinogenic risk, the hazard quotient (HQ) of each individual element in any of the samples was below the limit of 1 when the adult population was considered. However, in case of older and younger adolescents, the HQ for Hg in 1 seed sample, and additionally for younger ones, for Mn in 1 seed and 1 protein sample, exceeded the limit. The hazard index, a summary metric for all elements in a sample, exceeded 1 for numerous samples: 1 oil, 8 protein, and 6 seed samples in case of adult consumers, an additional 2 seeds for older adolescents, and 1 protein and 5 seeds for younger adolescents. The margin of exposure (MOE) associated with Pb nephrotoxicity was below 10 for the 4 oils and 1 seed sample if consumed by adults, but an additional 1 and 2 seeds for older and younger adolescents, respectively. The carcinogenic risk due to As exposure exceeded the tolerable 1 extra lifetime cancer case per 100,000 persons across the population groups, for 11/13/16 samples, or, when the MOE approach was applied, for 0/2/4 samples. Consumption of hemp foods by children would be even more disputable.

KEY WORDS: hazard index; ICP-MS; Lifetime Cancer Risk; margin of exposure; food safety

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