



POSTER

## FOOD SAFETY AND CONSUMER HEALTH RISK OF LEAD AND CADMIUM IN WILD BOAR (*SUS SCROFA*): MULTI-TISSUE DISTRIBUTION AND DEMOGRAPHIC FACTORS

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This study aimed to assess the consumer health risk associated with lead (Pb) and cadmium (Cd) exposure through the consumption of wild boar (*Sus scrofa*) meat and liver from animals culled in the Ripa Bianca Natural Reserve (Central Italy). To support the risk assessment, Pb and Cd concentrations, their distribution and bioaccumulation across different biological matrices, and the influence of sex and age were investigated. Liver, perirenal adipose capsule, muscle (musculus biceps femoris), and hair samples were collected from 17 wild boar culled during a wildlife management programme. Pb and Cd concentrations were determined by inductively coupled plasma optical emission spectrometry (ICP-OES). Parametric (ANOVA) and non-parametric (Kruskal-Wallis) tests, correlation analysis, and principal component analysis (PCA) were performed. Concentrations detected in muscle and liver were compared with the maximum levels established by Regulation (EU) 2023/915 for meat and offal of farmed animals, used as indicative reference values in the absence of specific limits for wild game. Consumer risk was evaluated by calculating the Estimated Daily Intake (EDI), Estimated Weekly Intake (EWI), Target Hazard Quotient (THQ), Hazard Index (HI), and, for Pb, the Margin of Exposure (MOE), following EFSA guidance. All exposure scenarios were established using Italian per capita

wild game consumption estimates for both the general population and the hunting population. Mean Pb and Cd concentrations (mg/kg) were 0.147 and 0.069 in muscle, 0.068 and 0.022 in liver, 0.134 and 0.056 in the perirenal adipose capsule, and 2.20 and 0.079 in hair, respectively. Mean Pb and Cd concentrations in muscle exceeded the indicative maximum levels established for the muscle of farmed animals, whereas liver concentrations remained below the corresponding limits. Strong positive correlations between Pb and Cd were observed in hair ( $r=1.000$ ), perirenal adipose capsule ( $r=0.989$ ), and liver ( $r=0.912$ ) ( $p<0.001$ ). Pb concentrations in liver were significantly higher in males than in females ( $p=0.046$ ), whereas age had no significant effect. PCA identified four independent components (94.1% cumulative explained variance), highlighting distinct accumulation patterns among biological matrices. Despite the exceedance of the indicative regulatory thresholds in muscle, all exposure indices (EWI, THQ, HI, and MOE) indicated a low health risk for both consumer groups. These findings suggest that current consumption patterns of wild boar meat from the study area do not pose a significant health concern for consumers. However, the absence of specific EU maximum levels for heavy metals in wild game meat represents an important regulatory gap that deserves consideration in future food safety policies.