

**RISK ASSESSMENT OF HEAVY METAL INTAKE IN PROCESSED  
FOOD**

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## ABSTRACT

### RISK ASSESSMENT OF HEAVY METAL INTAKE IN PROCESSED FOOD

High consumption of processed foods can cause various harmful health effects due to contamination of heavy metals. Four selected elements (Al, Cd, Cu and Pb) were investigated to determine the concentration, the carcinogenicity and to compare with permissible limit provided by World Health Organization (WHO). Four different brand of sausage samples (Brand V, X, Y and Z) and a control (homemade sausages) were prepared in wet digestion by using the mixture of HNO<sub>3</sub> and H<sub>2</sub>O<sub>2</sub>. The prepared samples and control were analyzed using inductively coupled plasma optical emission spectrometry (ICP-OES). The measured values were compared and calculated for exposure assessment provided by US EPA. The highest concentration measured for Al, Cd, Cu and Pb were 2.15 mg/kg, 0.08 mg/kg, 0.11mg/kg and 0.24mg/kg respectively. The highest total target hazard quotient (TTHQ) value was  $1.765 \times 10^{-4}$  for Brand Z compared to other brands. Furthermore, for the hazard index (HI) value is  $6.677 \times 10^{-4}$ . All the TTHQ and HI values measured were not exceeding the limit which shows the consumers are not experiencing harmful health effects such as cancer. The highest cancer risk calculated for Cd and Pb were  $0.6972 \times 10^{-6}$  and  $2.9145 \times 10^{-9}$  respectively. All carcinogenic elements were not above  $1 \times 10^{-6}$  showing the effects are not dangerous. In comparison with the permissible limit, all sausages were exceeding the limit of Cd (0.025 mg/kg), but not at exceeding limit for Cu (0.05 – 0.5 mg/kg). Brand Y (0.11mg/kg) was the only sample that exceeded the limit of Pb. Meanwhile, the highest value of Al measured was 2.15mg/kg for control and above the limit. The measured concentrations helped in estimating the risks of health effects on consumers.

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