

**EVALUATION OF TOXIC METALS CONCENTRATION IN  
DIFFERENT BRANDS OF DEODORANT PRODUCT**

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## ABSTRACT

### EVALUATION OF TOXIC METALS CONCENTRATION IN DIFFERENT BRANDS OF DEODORANT PRODUCT

The study was aimed to assess the level of some toxic metals in different deodorant product brands. Six (6) deodorants were analyzed for heavy metals after wet digestion with concentrated aqua regia ( $\text{HNO}_3:\text{HCl}=1:3$ ). The concentration of heavy metals (aluminum, lead, nickel, copper, iron and mercury) were determined in triplicate using inductively coupled plasma optical emission spectroscopy (ICP-OES) and cold vapor atomic absorption spectroscopy (CV-AAS) for mercury. The ranges of mean concentration in deodorants are 0.44-518.30, 0.38-0.60,  $3.99 \times 10^{-3}$ - $215.13 \times 10^{-3}$ , 0.28-0.42, 0.16-0.72  $\text{mg kg}^{-1}$  for Al, Ni, Hg, Cu and Fe respectively. In comparison to the permissible limit of the mean concentration of heavy metals in all deodorant were under the permissible limit set by the United State Food and Drug Administration (FDA) and the United State Pharmacopeia. The Systemic Exposure Dose (SED) after the deodorant application at  $0.5 \mu\text{g}/\text{cm}^2$  estimated that below their respective provisional tolerable daily intakes/recommended daily intakes. The Margin of Safety (MoS) values were greater than 100 which consider as safely for consumed, however, less than 100 values of MoS that indicated these products are containing unsafe metals for consumed in long terms such as Al and Hg. Frequently use the deodorant products for the long term may lead the metals accumulating in body tissues and hence cause certain health complications.