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Polycyclic Aromatic Hydrocarbons and Heavy Metal Contents of selected Smoked Meats

Alexander Ajai Ikechukwu

Department of Chemistry Federal University of Technology, Minna, Nigeria

Abstract

Polycyclic Aromatic Hydrocarbons (PAHs) and heavy metal contents of smoked chicken, fish and beef were investigated in this study using standard procedures. Analyte extraction was carried out using Sonication and Soxhlet extraction methods with two different solvents (n-hexane and Dichloromethane (DCM) and their combinations (n-hexane: DCM) and PAHs content determined using GC/MS. The total PAHs content in smoked Beef using Sonication method ranged from 36.15- 45.15 µg/kg, Soxhlet extraction method, from 33.04 - 42.80 µg/kg irrespective of the extractant, with n – hexane extract having the highest PAHs and n-hexane:DCM the least. Similarly, for smoked Chicken, the total PAHs content using Sonication method ranged from 50.45 - 55.91µg/kg irrespective of the extractant, with n – hexane having the highest and DCM the least.. The highest concentration for individual PAHs was 11.65µg/kg and was obtained in Phenanthrene. Lower molecular weight PAHs made up 40.22 to 57.30% of the total PAHs in smoked Beef. The concentrations of PAHs in the smoked samples were higher than the fresh samples. However, the concentration of B[a]P and some other PAHs in the smoked beef and chicken were higher than the European Commission maximum permissible limits. There is need to continually monitor the concentrations of PAHs in food considering their toxicity. The result of heavy metal analysis using Atomic Absorption Spectrophotometer revealed that Zn had the highest concentration (11.00 to 44.61mg/kg among the metals analysed while Cd had the least (0.032 to 0.075mg/kg). Concentrations of some of the metals in the smoked samples were within safe limit based on International Standard (WHO and FAO). The concentrations of the metals were in the order: Zn>Fe>Mn>Cu>Pb>Cd.

Biography:

Alexander Ajai, Ikechukwu, Department of Chemistry Federal University of Technology, Minna, Nigeria.

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