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Dietary Exposure to Acrylamide from Traditional Indian Snacks: Assessment using Analytical and Exposure Modelling Approach

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Acrylamide, a probable human carcinogen formed during high-temperature cooking of starchy foods, poses significant concerns for both human health and food safety. While extensively studied in Western diets, limited data are available on its presence in traditional Indian snack foods that are widely consumed during festive and daily occasions. This study aimed to quantify acrylamide levels in sixteen commonly consumed deep-fried snacks collected across districts of Tamil Nadu, India, and to assess the associated dietary exposure across different age groups. Food samples were homogenised, defatted, and subjected to extraction, followed by High-Performance Liquid Chromatography (HPLC) analysis for acrylamide determination. Exposure assessment was performed by integrating measured acrylamide concentrations with food consumption data normalised to body weight. Results revealed a wide variation in acrylamide concentrations, ranging from 569.2 µg/kg in Bhaji to 10,390.6 µg/kg in Gulab Jamun. Age-linked exposure modelling indicated that children (7–12 years) exhibited the highest dietary intake relative to body weight, exceeding tolerable daily intake thresholds, followed by adolescents (13–19 years) and adults (20–64 years). These findings underscore a pressing need for risk mitigation strategies, improved processing practices, and regulatory guidelines tailored to traditional Indian foods. By providing quantitative exposure data and highlighting vulnerable populations, this study contributes to the broader goal of safeguarding public health and promoting safer food systems.

Keywords: Acrylamide, Dietary exposure, Food safety, HPLC, Traditional Indian snacks

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