ABSTRACT

POLYCYCLIC AROMATIC HYDROCARBONS IN JAMAICAN JERKED MEATS

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Selected Polycyclic Aromatic Hydrocarbons (PAHs), prioritized as environmental pollutants, were investigated in chicken and pork samples grilled under common commercial jerking practices (traditional, open, jerk pan and oven) in Jamaica. This is the first such investigation.

Meat and poultry samples were initially characterized by proximate composition and their major fatty acids. Chicken cuts (leg-thigh and breast-wing) were higher ($p < 0.05$) in moisture and total polyunsaturated fatty acids (PUFAs) than pork cuts which were in turn higher ($p < 0.05$) in fat, protein and total saturated fatty acids (SFAs). Similar monounsaturated fatty acids (MUFAs) and ash levels were observed in chicken and pork cuts.

Total PAHs and total carcinogenic PAHs across the commercial jerking methods were in the ranges of $137 \pm 57 - 931 \pm 937$ μg/kg and $3.9 \pm 3.1 - 68.3 \pm 63.4$ μg/kg, respectively. Higher levels of total carcinogenic PAHs were observed with increasing levels of meat doneness. The highest and lowest producers of total carcinogenic PAHs were the jerk pan and open jerking methods, respectively. Generally, jerked chicken breast-wing showed lower concentration of PAHs compared to the chicken leg-thigh and pork samples which showed similar levels.

Benzo[a]pyrene was found to be a suitable marker for total carcinogenic PAHs and was below the reference limit (5 μg/kg, the EU regulatory limit for smoked meats) in 84% of the jerked meat samples analyzed in this study. Interestingly, total PAHs showed a positive ($p < 0.05$) correlation with the fat content of the jerked meats. A negative ($p < 0.05$) correlation was observed between PUFAs and total PAHs in jerked meats for the first time.

It is recommended as a precaution, that: (1) jerked meats be eaten moderately, (2) steps should be taken to minimize consumption of overdone/charred meats and (3) consideration be given to redesigning the jerk pan.

Keywords: Dwyte Nikomar Bremmer; Polycyclic Aromatic Hydrocarbons; Jerked Chicken; Jerked Pork; Jamaica