The Effect of Grilling Method on Concentrations of Seven Carcinogenic Polycyclic Aromatic Hydrocarbons in Grilled Chicken Breasts

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The investigation examined the effect of grilling method on concentrations of the carcinogenic polycyclic aromatic hydrocarbons (PAHs) benzo(a)pyrene, naphthalene, fluorene, phenanthrene, indeno[1,2,3-cd]pyrene, and benzo(k)fluoranthene/benzo(b)fluoranthene in grilled chicken breasts with skin. As grilling is a chicken cooking method that has been suggested to create carcinogens, the purpose of the experiment was to determine the grilling method that produced the fewest polycyclic aromatic hydrocarbons (PAHs) and was, then, the “safest” method of grilling chicken. Skinned chicken breasts were grilled under controlled conditions on a plain grill, a smoker barbecue, a silicone grill mat, and a stainless steel pan before being homogenized and run through extraction and clean-up procedures. Extracts were then run on a Gas Chromatograph-Mass Spectrometer to determine PAH concentrations. The total average PAH concentration in raw chicken was 244 ng/g, while it was 550 ng/g for plain grilled chicken. Chicken grilled on the stainless steel pan had a total average PAH concentration of 927 ng/g, and chicken grilled on the grill mat had a concentration of 1616 ng/g. The highest total average PAH concentration was in chicken grilled on the smoker barbecue, with a concentration of 1720 ng/g. It is concluded, then, that the best grilling method for producing the lowest total average concentration of PAHs is grilling on a plain, propane grill, while grilling on a smoker barbecue produces the highest concentrations of PAHs.

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