THERMAL TREATMENT EFFECT ON POLYCYCLIC AROMATIC HYDROCARBON (PAH) CONTENT IN SHEEP AND CHICKEN MEAT PRODUCTS

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Abstract

The effect of thermal treatment (smoking temperature) on the polycyclic aromatic hydrocarbon (PAH) content in sheep and chicken meat products was determined in this paper.

Gas chromatography tandem mass spectrometry was used to determine the type and concentration of thirteen PAH compounds in sheep and chicken meat products. The results were presented as the total PAHs, total *high molecular weight polycyclic aromatic hydrocarbons* (HMW PAHs), total nontoxic PAHs, and total low molecular weight *polycyclic aromatic hydrocarbons* (LMW PAHs) content. Total PAH concentration was expressed as the equivalent of benzo(a)pirene (BaPeq).

In products analyzed the presence of genotoxic PAH compounds was not found. The total PAHs in the sheep meat products were as follows: 27.41 - 79.34 µg/kg (warm smoking) and 32.39 - 111.31 µg/kg (cold smoking). Chicken meat products, on the other hand, had much lower concentrations of PAH compounds: 8.17 - 17.26 µg/kg (warm smoking) and 2.21 - 27.41 µg/kg (cold smoking). Regardless the production process following 5 PAH compounds in the final sheep meat products were determined: acenaftilene (Acy), fluoren (Fln), phenanthrene (Phe), anthracene (Ant) and pyrene (Pyr). In the final chicken meat, the presence of phenanthrene (Phe), anthracene (Ant) and pyrene (Pyr) was found. The content of other analyzed PAH compounds was below the detection limit. In products smoked throughout the pasteurization (warm smoking), the change in temperature had the bigger effect on the PAHs content than the smoking time. On the other hand, in cold smoking more influential factor had the smoking time.

Regardless of the meat type, the smoked processes tested did not significantly affect the content of individual and total PAHs in the products, and the products obtained were safe to consume, according to current regulations.

Key words: *Thermal treatment, Chicken meat, Sheep meat, PAH content.*