Abstract

The analysis of the chosen fibre and process conditionings of the polycyclic aromatic hydrocarbons content in the cured meat products smoked by the use of traditional methods

The aim of the present research was the analysis of the chosen raw materials and process conditionings of the polycyclic aromatic hydrocarbons content in the cured meat products smoked by the use of traditional methods. During the research, the overall fat content, weather conditions during the process of smoking and the cleanliness of the smokehouse from the polycyclic aromatic hydrocarbons content in the six chosen cured meat products smoked by the use of traditional methods was analysed.

The research material was the cured meat products produced in one of the meat processing plants located in the Podkarpackie voivodeship. The research material consisted of the following cured meat products: kornetka, kiełbasa wiejska z Górna, sucha wieprzowa z Górna, szynka swojska, boczek parzony and kabanos wieprzowy.

The polycyclic aromatic hydrocarbons content was measured by the use of the high performance liquid chromatography (HPLC). The level of the following polycyclic aromatic hydrocarbons contamination was determined: benzo(a)antracene, benzo(b)fluoranthene, 5-methylchrysene, benzo(c)fluorene, benzo(g,h,i)perylene, benzo(j)fluoranthene, benzo(k)fluoranthene, dibenzo(a,e)pyrene, dibenzo(a,h)anthracene, dibenzo(a,h)pyrene, dibenzo(a,i) pyrene, dibenzo(a,l)pyrene, indeno(c,d)pyrene. The basic chemical composition of the analysed cured meat products was conducted during the research as well.

The results obtained during the research were analysed statistically by the use of the software package Statistica 12. In order to verify the hypothesis of the influence of the fat content on the amount of the polycyclic aromatic hydrocarbons in the analysed cured meat products, the method of one-way analysis of variance was employed. In order to verify the hypothesis of the influence of weather conditions on the amount of the PAH in the analysed cured meat products, the method of two-factor analysis was employed, and to verify the hypothesis of the influence of the cleanliness of the smokehouse on the amount of PAH in kiełbasa wiejska, the Student's t-test was employed.

The conducted research proved that smoking the cured meat products by the use of the traditional methods was the cause of their contamination by the polycyclic aromatic hydrocarbons. The conducted research indicated that the synthesis of polycyclic aromatic

hydrocarbons in the process of smoking by the use of traditional methods unfolds rapidly and multidirectionally, as well as that various multicomponent mixtures of the PAH are created simultaneously, and these mixtures determine the final profile of the PAH.

Among the analysed cured meat products, the highest level of the polycyclic aromatic hydrocarbons concentration was identified in kiełbasa wiejska. Kabanos and szynka swojska were also the products significantly prone to the PAH cumulation. The research indicate that the most subjected to the PAH contamination were the products which were smoked lastingly, were marked by a large absorption area and a small cross-sectional area. The statistically significant factor influencing the polycyclic aromatic hydrocarbons content was the overall fat content of the smoked meat products. It was identified that the analysed cured meat products with the above 20% fat content cumulated approximately twice more PAH compared to the cured meat products with less than 10% fat content. The research indicated statistically significant influence of the chosen weather conditions during the process of smoking on the polycyclic aromatic hydrocarbons content in the analysed meat products. It was verified that the relative air humidity increase and the atmospheric pressure increase caused the decrease of the PAH content in the analysed products. The research proved that the sanitary condition of the smokehouse was the factor influencing the cured meat products contamination.

By the example of kiełbasa wiejska, it was proved that all the analysed polycyclic aromatic hydrocarbons content in the product smoked in the refined smokehouse was statistically significantly lower.

Karolina
Chorosky