

## QUANTITATION OF POLYCYCLIC AROMATIC HYDROCARBONS (PAH) IN FISH, MEAT PRODUCTS, AND CHEESE USING HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

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**Keywords:** Polycyclic aromatic hydrocarbons, meat, cheese, HPLC

### Background

The PAH have been contaminants since mankind began using open firing with wood to cook and fry products of hunting and fishing; nevertheless, only the last 30 years have seen systematical studies in order to detect and elucidate these compounds. Modern methods of cooking have lowered the risk of contamination distinctly. Roasting, grilling, and smoking of food, especially with possible contact with flames, may still represent considerable concern, regarding the carcinogenic potential of some of the PAH.

### Objectives

To get a comprehensive survey of the contamination of meat products and cheese (differentiation between cheese produced over open firing with wood and the one produced with usual technology).

### Method

The samples are homogenised; the fats are saponified by heating the samples in a solution of KOH in ethanol. The PAH are then extracted with cyclohexane. The chromatographic separation of 15 different PAH occurs on a reversed-phase column with gradient elution and programmed fluorescence detection with variable wavelength.

### Results and discussion

Limits of detection: 0.1 ng/ml (standard substances); 0.1 mg/kg (cheese); 1.0 mg/kg (fish, meat products)

Recovery: above 80 per cent.

The concentrations of PAH with carcinogenic potential (benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, dibenzo[a,h]anthracene, benzo[g,h,i]perylene, indeno[1,2,3-c,d]pyrene) are fortunately very rarely present and usually below 10 µg/kg. Relying on the chromatogrammes and on the concentrations of the PAH it can easily be differentiated between the two manufacturing processes of cheese.

### Conclusions

The present work (and analyses of about 200 samples of meat/meat products and of 12 different samples of cheese) describes some analytical improvements and simplifications. These modifications give rise to lower limits of detection and to more clearly separated peaks in chromatogrammes. This method is relatively simple, fast and has shown that the PAH originate either from the environment or from the manufacturing process.