

Smoked mackerel home to potential carcinogens

14/09/2004 - Extending food scientists' understanding of potential carcinogens in fish products Greek researchers identify high levels of potentially carcinogenic compounds in cold- and hot-smoked mackerel samples.

Scientists at the school of food technology and nutrition in Thessaloniki, Greece compared smoked mackerel samples with a batch immersed in salt and fructose, the common fruit sugar. Both techniques produced fish with unacceptably high levels of harmful polycyclic aromatic hydrocarbons (PAHs).

"Benzo(a)pyrene, fluoranthene and perylene were at high levels both in cold- and hot-smoked samples and were, as expected, influenced by the temperature," report the scientists in the September 2004 issue of the *Journal of the Science of Food and Agriculture* (vol. 84, no. 12, pp. 1545-1552(8)).

Increasingly pinpointed by consumer organisations as a food safety issue in the food chain, PAHs are a group of over 100 different chemicals that are formed during the incomplete burning of coal and oil, or other organic substances like tobacco or charbroiled meat.

Consumers might be exposed to PAHs by eating grilled or charred meats, contaminated cereals, flour, bread, vegetables, fruits, meats as well as processed or pickled foods.

The greek scientists highlighted the role that the amino acid lysine played in interacting with the carbonyls.

"The available lysine in all hot smoked samples was reduced to the same extent (32 per cent) whilst a very good correlation was observed between loss of available lysine and colour formation of the cold-smoked products," they write.

In addition, the potential allergen histamine was found in highly unacceptable levels, even in the unprocessed samples (600 mg kg⁻¹) and strongly increased (2220 and 2250 mg kg⁻¹) in the cold- and hot-smoked samples, respectively, due to all treatments.

"These are levels which would be expected to cause symptoms of scombrototoxin poisoning," claim the researchers.

The European food industry has taken on board concerns linked to PAHs and food production with a range of new initiatives to co-ordinate research findings. Scientists in Spain, for example, have compiled an extensive database of harmful compounds formed during food preservation and cooking.

Led by Paula Jakszyn at the University of Barcelona in Spain, the researchers set out to develop a food composition database of nitrates, nitrites, nitrosamines, heterocyclic amines (HA), and polycyclic aromatic hydrocarbons (PAH) in foods.

"An accurate assessment of dietary intake of such compounds is difficult, mainly because they are not naturally present in foods, and they are not included in standard food composition tables," said the researchers, reporting their findings in the August issue of the *US Journal of Nutrition*, (134:2011-2014, 2004).