

# THE COOKING USING DIFFERENT FUELS AND THE LEVEL OF INDOOR AIR PAHS

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**Background and Aims:** To understand the impact of cooking by daily fuels on the levels of indoor air polycyclic aromatic hydrocarbons (PAHs).

**Methods:** Four households with similar house structure and economic conditions were chosen in a village of North Jiangsu province. Fuels (including straw, coal and liquefied petroleum gas (LPG)) were used to cook the same foods in each kitchen. Indoor air PAHs (including those adsorbed on PM<sub>10</sub> and in gaseous state) were collected and detected during cooking.

**Results:** The majority of PAHs (including PAHs adsorbed on PM<sub>10</sub> and in gaseous state) in indoor air produced by all 3 fuels burning was those under 4-ring and gaseous PAHs. The median percentages of PAHs under 4-ring and in gaseous state accounting for total PAHs were 93.86% (93.63% ~ 94.52%) and 94.20% (81.36% ~ 94.34%), respectively. The levels of total PAHs in kitchen air produced by straw, coal and LPG burning were 4.70 $\mu\text{g}/\text{m}^3$ , 3.91 $\mu\text{g}/\text{m}^3$  and 3.65 $\mu\text{g}/\text{m}^3$ , respectively. The levels of gaseous PAHs in kitchen air brought by all 3 fuels combustion were higher than those adsorbed on PM<sub>10</sub>. The median difference between gaseous and adsorbed on PM<sub>10</sub> was 3.05 $\mu\text{g}/\text{m}^3$  (2.49 $\mu\text{g}/\text{m}^3$  ~ 3.29 $\mu\text{g}/\text{m}^3$ ). The levels of PAHs adsorbed on PM<sub>10</sub> in kitchen air produced by straw, coal and LPG burning were 0.738 $\mu\text{g}/\text{m}^3$ , 0.204 $\mu\text{g}/\text{m}^3$  and 0.198 $\mu\text{g}/\text{m}^3$  respectively, while the levels of gaseous PAHs were 3.97 $\mu\text{g}/\text{m}^3$ , 3.70 $\mu\text{g}/\text{m}^3$  and 3.45 $\mu\text{g}/\text{m}^3$  respectively. PAHs under 4-ring adsorbed on PM<sub>10</sub> accounted for 64.22% (63.13%~82.52%). PAHs under 4-ring dominated gaseous PAHs and received 95% (95.49% ~ 96.41%) as well.

**Conclusions:** The majority of PAHs in indoor air brought by all 3 fuels combustion was PAHs under 4-ring and in gaseous state. Straw burning produced the maximum PAHs, coal finished the second, and LPG got the minimum.