

# THE EFFECTS OF DAILY FUELS COMBUSTION ON INDOOR AIR QUALITY IN RURAL CHINA

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**Background and Aims:** To understand the influence of daily fuels (including biogas, straw, coal, and liquefied petroleum gas (LPG)) in rural China on the levels of indoor air SO<sub>2</sub>, NO<sub>2</sub> and CO.

**Methods:** In rural northern Anhui province, we chosen 20 households, with the same house structure and completely separated kitchens which had very similar size, ventilation and stoves location. Of them, biogas, straw, coal, or (LPG) were used as the daily fuel in each 5 households respectively. Successively 48h SO<sub>2</sub> and NO<sub>2</sub> in kitchens and bedrooms were collected by Radiello passive diffusion tubes and 48h CO successively measurements were taken using EL-USB-CO (Lasca, UK).

**Results:** Among the 4 daily fuels, there was no any difference in levels of SO<sub>2</sub>, NO<sub>2</sub> and CO in bedroom air, which were much lower than those in kitchen air. The levels of 3 indoor air pollutants in the kitchen air produced by coal combustion were significantly higher than those produced by other fuels. The geometric mean of SO<sub>2</sub> and NO<sub>2</sub> were 3196.48µg/m<sup>3</sup> and 67.90µg/m<sup>3</sup>, respectively. And means of the top 3 peak concentrations of CO were 633.9ppm, 510.27ppm and 408.80ppm, respectively. In addition, straw had a relatively large effect on indoor air quality (IAQ). The levels of NO<sub>2</sub> and CO in kitchen air from straw combustion were higher than those from LPG and biogas. The geometric mean concentration of NO<sub>2</sub> was 25.40µg/m<sup>3</sup>, and means of the top 3 peak concentrations of CO were 75.11ppm, 42.98ppm, 31.07ppm, respectively. LPG and biogas showed less influence on 3 kitchen air pollutants.

**Conclusion:** IAQs in kitchen air were mainly influenced by daily fuels in study area, while those in bedroom air were barely influenced. Coal burning brought the most serious indoor air pollution, and LPG and biogas were relatively clean.