

**Title:** Exposure to airborne ultrafine particles from cooking in Portuguese homes

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**Abstract:** Cooking was found to be a main source of submicrometer and ultrafine aerosols from gas combustion in stoves. Therefore, this study consisted of the determination of the alveolar deposited surface area due to aerosols resulting from common domestic cooking activities (boiling fish, vegetables, or pasta, and frying hamburgers and eggs). The concentration of ultrafine particles during the cooking events significantly increased from a baseline of 42.7  $\mu\text{m}^2/\text{cm}^3$  (increased to 72.9  $\mu\text{m}^2/\text{cm}^3$  due to gas burning) to a maximum of 890.3  $\mu\text{m}^2/\text{cm}^3$  measured during fish boiling in water, and a maximum of 4500  $\mu\text{m}^2/\text{cm}^3$  during meat frying. This clearly shows that a domestic activity such as cooking can lead to exposures as high as those of occupational exposure activities.

**KeyWords Plus:** Particulate Air-Pollution; Surface-Area; Fine Particles; Organic Aerosol; Meat-Cooking; Mass; Number; Lung; Gas; Distributions

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