

INDOOR AIR POLLUTION

Cookstove startup emissions

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Credit: Julia Dresch/Oneworld Picture/UIG via Getty Images

Indoor cookstoves that burn solid fuels are a major contributor to indoor air pollution and can present significant health risks. Designing more-efficient cookstoves is a major area of research, and emissions from common fuels, such as wood and charcoal, have been well studied. However, emissions from startup materials used for ignition have not been well documented.

Kristen Fedak and colleagues at Colorado State University, USA, measured emissions from eight common cookstove startup materials: newspaper, knotted plastic bags, foam-based footwear, bicycle inner-tube rubber, foil-lined food packaging such as crisp bags, fabric, kerosene, wood shims (tapered wedges of wood) and kindling. They measured the emissions of several pollutants likely to affect human health. These included particulate matter (<math><2.5\mu\text{m}</math> diameter), carbon monoxide, carbon dioxide, methane, formaldehyde, benzene, toluene, ethylbenzene and xylene. Emissions are dependent on the amount of material required, so emissions were standardized on a 'per startup' basis. Kerosene is one of the most commonly used fuels for startup, and it is the main fuel in some advanced cookstove designs. However, it was consistently one of the highest emitters for several pollutants, as were kindling, newspaper, and wood shims. Plastic bags were the lowest emitter of almost every pollutant measured. Food packing and fabric were also consistently among the lowest.

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