

ABSTRACT

Improved clean cookstoves are cooking technologies, in which, through an appropriate combustion process using biomass as fuel, the following is achieved: reduction of pollutants, reduction of biomass consumption and greater safety compared to a traditional stove. Implementation of clean cookstove interventions, which are currently spreading in the country, during the installation of the stoves do not usually consider the characteristics of the home environment; For this reason, the stoves are altered in order to adapt them to the conditions of the house, which causes changes in the energy aspect and this in the performance of the stoves. This research analyzed, how the height of the chimney and the type of fuel impact thermal efficiency, the intramural concentration of CO and PM_{2.5} of three models of improved cookstoves most used in Peru; The Water Boiling Test (WBT) methodology was used, which allowed the calculation of the thermal efficiency of each improved cookstoves model with three changes in chimney length and with two fuels (eucalyptus firewood and bovine manure); Additionally, by placing an IAP (indoor air pollution) measurement equipment, the intramural concentrations of pollutants were measured for 24 hours. Through tests carried out in a controlled environment, was possible to analyze the effects of the variables independently and jointly. The results of the research indicate that the length of the chimney significantly impact the thermal efficiency of the Inkawasi 03 hornillas-GIZ Improved clean cookstove model, registering a greater thermal efficiency with a shorter length. In the case of the type of fuel, this significantly impact the thermal efficiency of the three stove models evaluated; being the type of fuel with the lowest calorific value (cow dung), the one that provides the highest thermal efficiency. Concerning to the intramural concentration of CO and PM_{2.5}, the length of the chimney changes the 24-h intramural concentration of CO for the Inkawasi Pichqa-GIZ model, the concentration being higher for a lower height. In the case of 24-h PM_{2.5}, the concentration change for the Inkawasi 03 hornillas-GIZ and Inkawasi Sembrando 1 model; the concentration being higher for a length of 2.4m. Likewise, the results of the three models of improved stoves evaluated show intramural concentration during 24-h of CO less than 7 mg/m³ (WHO, Indoor Air Quality) for the three chimney lengths and the two types of fuel evaluated; and greater than 35 µg/m³ (WHO, Indoor Air Quality), of PM_{2.5} only in the case of cow dung as fuel.