

Daniel Culver  
*Improved Indoor Biomass Cook Stove*

The motive of this investigation was to construct a biomass cook stove that does not release a dangerous quantity of carbon monoxide when used indoors because 2 million people die each year due to carbon monoxide. I hypothesized that if convection currents were utilized to provide more oxygen, then the fire would emit less carbon monoxide.

This experiment involved designing and producing a cook stove that generated convection currents to aid the combustion process to reduce harmful by-products. I filled the windows of a stock trailer with cardboard to mimic conditions in houses in developing countries. Next, I placed cinder blocks in the stock trailer to prevent hot coals from damaging property and built a fire pit. A 2" x 6" x 12" board was chopped finely and burned in the pit, while a carbon monoxide detector displayed the quantity of carbon monoxide in parts per million during three tests. I then tested my biomass cook stove under the same conditions three times.

After testing, I determined that the results supported my hypothesis. The stove I designed released an average of 8.6 parts per million of carbon monoxide. The open fire billowed out an average of 92.3 parts per million, which is a very dangerous level.

These results lead me to believe that improvements made to my stove design could reduce carbon monoxide poisoning fatalities, which total more than 2 million worldwide annually. I believe that my stove could improve the lifestyle of millions of people around the world.