

DESIGN, FABRICATION AND PERFORMANCE EVALUATION OF A
PROTOTYPE MULTI-COMMODITY FOOD SMOKER

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By

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ABSTRACT

The study was conducted to design, fabricate and evaluate a prototype multi-commodity food smoker. Fabrication was done last July 2019 at a machine shop in Molo, Iloilo City while evaluation took place at the Appropriate Technology Center under the College of Agriculture, Resources, and Environmental Sciences of Central Philippine University in Jaro, Iloilo City from October 29, 2019 to November 14, 2019. The machine is composed of main parts made from food grade materials; namely, main frame, smoking chamber, door with sight glass, removable furnace, air regulator, chimney, smoke regulator, removable racks, rack holder and thermostats. It has an overall dimension of 53 cm L x 52 cm W x 50 cm H. The commodities used for smoking were milkfish, chicken breast and pork chop while the fuels used to supply heat and smoke were charcoal, coconut husks and coconut shell. Except for charcoal, these biomass fuels underwent disinfection by submerging them in boiling water. The machine can accommodate 0.990 kg of milkfish, 1.021 kg of chicken breast and 0.851 kg of pork chop per loading. The fuel consumption rate for milkfish, chicken breast and pork chop were 0.61 kg/hr, 0.71 kg/hr and 0.63 kg/hr, respectively. The percent shrinkage in all products ranged from 29.58 to 37.37%, while the heat utilization efficiency of the machine ranged from 12.53 to 16.25%. The computed operating cost of the machine was PHP138.68 for milkfish, PHP134.47 for chicken breast and PHP161.33 for pork chop. The organoleptic assessment scored above average in all commodities which means the smoked products were of acceptable quality.