DEVELOPMENT OF FISH DRYER-SMOKER

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The author, Christian Castro Delos Santos is son of Mr. Domingo O. Delos Santos and Mrs. Rosemarie C. Delos Santos. He was born on the 20th of March in the year of our Lord 2000 at Cabanatuan City, Nueva Ecija. He is 23 years old and resides in Cuyapa, Gabaldon, Nueva Ecija.

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ABSTRACT

DELOS SANTOS, CHRISTIAN C., and **BRIONES, MARK BERWIN M.** Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, **FEBRUARY 2024.** **DEVELOPMENT OF FISH DRYER-SMOKER**

Adviser: RUEL G. PENEYRA, M.Sc.

The study aimed to design, fabricate, and evaluate a Fish Dryer-Smoker producing high-quality and safe smoked fish. A proposed fish dryer-smoker was fabricated, and its drying and smoking performance was evaluated in terms of drying capacity, moisture reduction rate, and smoking capacity. The smoked fish produced using Fish Dryer-Smoker was evaluated using physicochemical, microbial, and PAH analysis.

The experimental design involved a 2-factor Completely Randomized Design, considering furnace blower speeds (16 m/s, 12 m/s, and 8 m/s) and smoke generator blower speeds (16 m/s, 12 m/s, and 8 m/s) as factors.

The dryer achieved a drying capacity of 27 kg/hr/batch with a mean moisture reduction rate of 18.89 %/hr. The smoker demonstrated a mean smoking capacity of 27 kg/hr.

In terms of product quality, the physicochemical analysis revealed that the smoked fish produced using a 16 m/s furnace blower and 12 m/s smoke generator speed obtained the lowest mean moisture content with a value of 57.98%. The furnace blower speed and its interaction with the smoke generator blower speed have significant effects on moisture content. On the other hand, the smoked fish produced using a 12 m/s furnace blower and 8

m/s smoke generator speed obtained the lowest mean water activity with a value of 0.881. Both blower speeds and their interaction significantly influenced water activity.

Sensory analysis indicated comparable acceptability scores, with the mean overall acceptability score of "like moderately". Microbiological analysis reported the absence of salmonella and shigella, with a mean aerobic plate count of 278,888 cfu/g. PAH analysis showed "not detected" levels for PAH compounds, indicating values below 2.00 μ/kg.

The simple cost analysis revealed an initial investment of Php 27,315.00, with a break-even capacity of 13,425.87 kg/yr at a custom rate of Php 5.00 per kilogram. Operating the machine for custom service resulted in an annual net income of Php 54,370.65/yr, yielding a remarkably short payback period of only 0.50 years.

Keywords: smoked fish; dryer; smoker; drying; smoking.

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