



Prototyping of Solar Dehydrator for Beef Products

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Keywords

dehydrator, Philippines,
renewable energy, solar,
technology

Abstract

Today's world calls for innovations that utilize renewable sources of energy. This study aimed to design and develop a solar dehydrator and test its efficiency in terms of air temperature, drying rate, return of investment (ROI), and payback period for beef. Project method and experimental research design was used. The beef solar dehydrator is structured with acrylic plastic top cover that allows heat to pass through while securing the beef samples away from possible contamination. The insulator foam inside the drying chamber traps heat within, raising the internal temperature and removing excess moisture from the samples. Drying period is from 8 AM to 6 PM for two days. The air temperature and drying rate were monitored in two-hour intervals for three trials. Results show that the highest average air temperature was 57 °C registered at 2:00 PM, while the lowest was at 26.66 °C during the first hour of drying. From the original weight of 4 kg, the weight of the samples gradually decreased to a final dried weight of 1 kg. Using the solar dehydrator, an annual income of PhP373,561.05 and a return of investment of 5.53%, with a payback period of 0.0085 year (less than a month of operation), was determined. It is recommended that the solar dehydrator be enhanced before disseminating to meat vendors and other entrepreneurs for adoption and utilization.