

COMPARATIVE ANALYSIS BETWEEN CONVENTIONAL DRYING AND CHILI DRYING USING AN OUTSEAL NANO BASED CHILI DRYER

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ABSTRACT

sCabai Cayenne pepper (Capsicum frutescens L.) is a high-value horticultural commodity that is highly perishable, requiring proper post-harvest handling. Conventional sun-drying is heavily dependent on weather conditions, making it unreliable during rainy or cloudy seasons. This study aims to design and analyze an Outseal Nano microcontroller-based chili dryer as an effective small-scale drying alternative that operates independently of weather conditions. The device utilizes a Type K thermocouple sensor for temperature detection, with an optimal operating temperature range of 70°C to 80°C. Testing was conducted in five trials with capacity variations ranging from 1 kg to 5 kg. The results indicate that the Outseal Nano-based dryer was able to dry chili with an average drying time of 16.2 hours, significantly faster than the conventional method which requires up to 53 hours. The final moisture content of the dried chili was below 12%, meeting the SNI quality standard for dried chili. Therefore, this drying device is proven to be more efficient, consistent, and capable of operating independently without reliance on weather conditions.

Keywords: *cayenne pepper, drying, PLC Outseal, weight loss, time efficiency*