

***Design Of Prototype Monitoring System Temperature And Humidity In Merang Mushroom
Barn Using Sugeno Fuzzy Method***

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ABSTRACT

Volvariella volvacea (straw mushroom) is one of the high-value agricultural commodities whose growth is highly influenced by environmental temperature and humidity. This study aims to design a prototype of a temperature and humidity monitoring system for straw mushroom cultivation using the Internet of Things (IoT) and the Sugeno fuzzy logic method. The system employs a DHT22 sensor to detect temperature and humidity levels, with an ESP32 microcontroller serving as the control center that processes data and transmits it to a web-based interface. The Sugeno fuzzy method is applied to automatically determine control decisions based on predefined rules regarding temperature and humidity levels. The prototype is built in the form of a miniature cultivation house and tested using a black-box testing approach. The test results show that the system is capable of providing automatic and appropriate responses to temperature and humidity changes, while also displaying real-time monitoring data. The implementation of this system provides significant benefits for farmers by enabling efficient monitoring of environmental conditions and improving the stability of the productive period of straw mushroom cultivation. Therefore, this system is feasible to be further developed as a smart technological solution in the agricultural sector, particularly in mushroom farming.

Keywords: *Straw mushroom, IoT, ESP32, Sugeno fuzzy, temperature, humidity, monitoring.*