

ABSTRACT

Drying Process of Tapioca Flour Using an Automatic Dryer Machine Based on Fuzzy Logic Control. The drying process is a crucial stage in the processing of tapioca flour to achieve a stable product quality. However, traditional drying methods that rely on sunlight face several challenges, such as dependence on weather conditions, long drying times, and a high risk of contamination. This research aims to design and develop an automatic tapioca dryer machine based on fuzzy logic control. The system is designed to adaptively regulate temperature and humidity using sensors, actuators, and a fuzzy logic algorithm to control the heating elements and stepper motor.

The prototype was developed using ESP32 microcontroller technology, temperature and humidity sensors, and spiral heating elements. Fuzzy control was employed to define the drying rules based on temperature and humidity parameters. Testing showed that the machine successfully maintained the final moisture content of the flour below 13%, in accordance with the Indonesian National Standard (SNI), with even heat distribution and improved efficiency compared to traditional methods.

With this automated system, the tapioca flour industry—especially small and medium-scale enterprises—can enhance productivity and reduce dependency on weather conditions. Furthermore, this innovation is expected to contribute to the advancement of intelligent food processing technology in Indonesia.

Keywords: drying machine, tapioca, fuzzy logic, automatic control,