

IoT-Based Semi-Automatic Broiler Chicken House Control System During the Brooding Period

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ABSTRACT

Broiler chickens are a protein-producing livestock commodity for which demand is constantly rising in Indonesia. The success of their rearing is greatly influenced by the management of the housing environment, particularly during the brooding period over the first 14 days, when the ideal temperature is 30–35°C. Conventional LPG-based heating methods have limitations in terms of efficiency, safety and ease of monitoring. This study aims to design a semi-automatic IoT-based house control system using an ESP32 microcontroller that receives data from a DS18B20 sensor, and a DHT22 sensor. Temperature control utilises a PID algorithm with parameters $K_p = 5$, $K_i = 3$ and $K_d = 0.5$ to regulate the PTC heater and DC fan. Cage data is transmitted to Firebase in real time every 30 seconds for remote monitoring. The system reaches the setpoint of 34°C within ± 13 minutes, without overshoot, and has a steady-state error of 0.2°C. This reduces reliance on manual supervision.

Keywords: IoT, ESP32, PID, brooding, broiler chicken, cage monitoring, Firebase

