

DESIGN AND BUILDING OF EGG HATCHING MACHINE USING THE PID METHOD TO KEEP TEMPERATURE STABILITY

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ABSTRACT

The process of hatching chicken eggs can be divided into 2, naturally and artificially with the help of an incubator. Natural egg hatching is carried out by the hen by incubating it in an incubator made of straw and provided by humans, while the egg incubator works to speed up and guarantee the hatching of chicken eggs. Hatching eggs naturally will usually experience various problems, such as hatchlings dying due to being crushed by a parent who has bad behavior. In addition, the hen is lazy to incubate the eggs. In other cases, chicken eggs are sometimes broken and eaten by the hen itself. In contrast to hatching eggs using a machine, the above conditions will not occur. The process of making an egg hatching machine must pay attention to various things such as temperature and humidity according to the type of egg being hatched, for example chicken eggs are in the range of 39°C and 55% humidity, the machine must be maintained so that the temperature is not far from that range. To support the smooth operation of this machine, the temperature and humidity data read by the DHT 11 sensor are processed by a PID control system which then gives orders to the lamp and humidifier components to adjust the temperature and humidity according to setpoints. Tuning obtained from the trial and error method with a value of $KP = 500.00$, $KI = 0.00$, and $KD = 0.00$, the results obtained are those with the lowest overshoot or not far from the set point. The average system error rate is at 2.16% temperature and 2.35% humidity.

Keywords : *Hatching eggs, egg hatching machines, PID*