ABSTRACT

As Indonesia's population grows, the need for chicken meat, both broiler chickens and free-range chickens, continues to increase. This certainly encourages farmers to continue to increase the number of chicken production, one of the efforts is by using automatic egg hatching equipment. However, suboptimal temperature and humidity in the egg hatcher can inhibit the development of embryos in eggs. The ideal temperature for hatching is 38ºC (37-39.5ºC), while the optimum humidity is 55% (50%-60%). Therefore, a control system is needed to maintain these optimal conditions. This research designed a temperature and humidity control system for egg hatching. Temperature is controlled using a PID controller with a set point of 38ºC, calculated using the Cohen-Coon tuning method to determine the parameters of Kp, Ki, and Kd. Humidity is controlled with an ON/OFF system, where the humidifier turns on if the humidity is below 55% and turns off if it reaches 55,3% or more.The results showed that this system was able to stabilize the temperature at 38.1ºC and humidity at 53%, with an error of 0.02% and 3.3%. The PID parameters used in the temperature controller are Kp=43,612, Ki=0,0179, and Kd=8,317.

Keywords: *Cohen Coon, Egg Hatcher, PID, Temperature and Humidity Control System*