

Abstract

Drying is an important method in animal feed processing to reduce moisture content, thereby extending shelf life and maintaining nutritional quality. This study aims to analyze the performance of a cabinet dryer utilizing the exhaust heat from a 1/2 HP split AC condenser as an alternative energy source. The performance parameters analyzed included drying rate, thermal efficiency, and specific energy consumption (SEC).

The research method was conducted by measuring the condenser outlet air temperature, air flow rate, and changes in feed mass during the drying process. The calculations show that the condenser exhaust heat generated an average heat energy of 1.61 kW, with a total energy consumption of 18.52 MJ over 4 hours of operation. The drying rate achieved was 0.75 kg water/hour m², with a thermal efficiency of 38.9%. The system's specific energy consumption was 6175 kJ/kg water, or approximately 1.72 kWh/kg water, which is within the efficiency range of waste heat-based drying systems.

Based on these results, the utilization of waste heat from split AC condensers has been proven to be a viable alternative energy source for drying animal feed. This system is not only energy efficient but also environmentally friendly because it utilizes previously wasted heat.

Keywords: Cabinet Dryer, Waste Heat, AC Condenser, Thermal Efficiency, Animal Feed