

ABSTRACT

The poor environmental quality of chicken coops due to the accumulation of ammonia gas (NH_3) can negatively impact the health of both livestock and farmers. This study aims to design and analyze the effectiveness of an odor-free chicken coop by utilizing bioactive materials as adsorbent media, namely zeolite, biochar, bentonite, dried leaves, wood twigs, and quicklime. These materials were selected based on their ability to absorb and neutralize ammonia gas to create a healthier coop environment. The research was conducted by designing a bioactive material-based chicken coop and measuring NH_3 levels over three days to evaluate its effectiveness compared to a conventional coop. The results showed that using bioactive materials could reduce NH_3 levels by 46% compared to traditional coops. Zeolite and bentonite were proven effective in absorbing ammonia gas, while biochar and organic materials such as dried leaves and wood twigs contributed to increasing media porosity and maintaining moisture balance. In conclusion, the odor-free chicken coop design based on bioactive materials has been proven to significantly reduce odors and improve air quality in poultry farming environments. The implementation of this technology is expected to be an innovative solution for more environmentally friendly and sustainable poultry waste management.

Keywords: chicken coop, ammonia (NH_3), bioactive materials, zeolite, biochar, bentonite, quicklime, adsorbent, environmental management