INTERNET OF THINGS BASED AMMONIA GAS CONTROL SYSTEM WITH PREBIOTIC LIQUID SPRAYING AUTOMATION USING FUZZY LOGIC METHOD:
ON LAYING HEN FARM IN GUMUKMAS SUB-DISTRICT, JEMBER DISTRICT

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ABSTRACT

Eggs are a highly sought-after food commodity in Indonesia, as they are an affordable source of animal protein. However, laying hen farmers often face the problem of air pollution and ammonia gas emissions in cages, which can negatively affect hen health and egg production. This research develops an Internet of Things (IoT) based ammonia gas control system with prebiotic liquid spraying automation using the Fuzzy Logic method on layer farms in Gumukmas Jember.

The fuzzy logic method is used to regulate ammonia gas detection by the MQ137 sensor and regulate the spraying time of prebiotic liquid automatically. The accurate ammonia gas measurement is integrated into an IoT control system involving Raspberry Pi 4 as the main microcontroller. The system can enable prebiotic liquid spraying to keep ammonia gas levels stable and support the welfare of laying hens.

The test results show that this system can keep ammonia gas levels below the safe threshold, with a high level of accuracy and responsiveness. The use of fuzzy logic in decision making provides an adaptive and effective solution in maintaining an optimal cage environment. With the implementation of this system, it is expected that farmers can improve production efficiency and welfare of laying hens in Gumukmas Jember.

Keywords: (IoT, ammonia gas, laying hens, fuzzy logic)