

Application of IR and UV Radiation in an Intelligent Chicken Farm for High Production and Green Environment

For chicken industry, hens are raised in large farmhouses which usually difficult to control for complete sanitation. It is very likely that contamination of chicken meat and eggs could occur. This research project aims to improve farmhouse floor disinfection and eggshell sanitization using UV and IR irradiation in aspects of time-saving, accuracy and environmental friendly.

Rice husks are widely used for flooring in chicken farm. Proper and reliable sanitization of the rice husk before their employment in the chicken farm is critical as one infection may cause result in a loss of an entire chicken batch in the farm. At present, most sanitization techniques are based on the use of sunlight or chemical product such as Formalin which may be subjected to human error or has detrimental effect toward to human health and environment. This project aims to develop and test a proof-of-concept prototype of rice husk disinfection apparatus by infrared irradiation for chicken farm flooring. Total aerobic plate count will be used to identify the level of bacteria on rice husks after infrared irradiation in order to identify the temperature and time duration required for efficient disinfection.

To replace sanitization of eggshells by formaldehyde fumigation in chicken farm, UV disinfection is further explored. Treatment of UV light together with ozone and hydrogen peroxide is implemented for eggshell decontamination. A prototype UV irradiation system was built with special function that can rotate egg in all direction for complete sanitization of eggshell. The equipment was tested to treat eggshell coated with *Salmonella* sp. bacteria. The result showed that egg sanitization using UV treatment together with ozone incubation give significant decrease of bacteria population. By adding hydrogen peroxide exposure to the process, the complete bacteria decontamination was achieved.

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