International Scholars Journals

African Journal of Poultry Farming ISSN 2375-0863 Vol. 9 (2), pp. 001, December 2021.
Available online at www.internationalscholarsjournals.com © International Scholars Journals

Perspective

Study of a solar poultry egg incubator

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Accepted 24 December 2021

DESCRIPTION

Changes in global temperature, a rise in per capita demand for meat and eggs, and the advent and spread of numerous illnesses are all impediments and problems facing the poultry sector. Among them, environmental issues are one of the most serious hindrances to poultry development and production. Chickens are extremely sensitive to high ambient temperatures (thermal stress), which has a severe impact on their development and production, resulting in significant economic losses. These losses are projected to grow in the near future as a result of global warming. Climate change and rising global temperatures, in particular, have exacerbated the negative impacts of heat on poultry production across the world.

Salmonellosis is a serious issue that is now threatening the chicken industry across the world. The most virulent serovars in avian species are Salmonella gallinarium and Salmonella pullorum (Fowl Typhoid), which cause systemic illness and considerable economic losses in the poultry sector. Salmonella nontyphoidal serotypes (Paratyphoid illness) are a public health risk because of their role in food poisoning as well as their zoonotic significance. Furthermore, Salmonella species have a wide range of dispersion. For a long time, they defied environmental circumstances that made it impossible to limit their expansion. As a result, the current review aimed to shed light on Salmonellosis in poultry, specifically its pathogenesis, economic importance, immune response to Salmonella, Salmonella antibiotic resistance, and potential methods for prevention and control of such problems using promising antibiotic alternatives such as probiotics, prebiotics, symbiotics, organic acids, essential oils, cinnamaldehyde, chitosan, nanoparticles, and vaccines.

This research examines the performance of a hybrid solar-powered poultry egg incubator. A double-glazed flat plate solar collector is combined with a paraffin type phase change material energy storage subsystem and a PV subsystem to create the system. The study found that the chamber temperature was between 36 and 39 degrees Celsius, with a relative humidity of 50 to 75 percent. The storage medium and absorber plate were found to have temperature ranges of 42˚C-106˚C and 38˚C-99˚C, respectively, with an average egg hatchability of 62.37 percent utilising the hybrid solar powered chicken egg incubator. The hatchability of the incubator and the % fertility of the poultry eggs were determined using biological tests. To prevent egg yolk from clinging to the shell, the eggs were rotated five times daily at three-hour intervals. The flipping of the eggs, however, was halted after day 18 to allow the embryos to begin piping. On the 5th and 14th days, a Candler was used to measure the % fertility of the eggs, and crack, infertile, and dead embryos were found.

The rapid expansion of human economic activity, including agricultural and animal production, results in significant amounts of waste being released into the environment from poultry farms, slaughterhouses, the leather industry and hatcheries. Despite the fact that the chicken industry contributes significantly to the alleviation of poverty, starvation, and unemployment, it also generates a variety of waste products. Due to its abundance, high mechanical stability, resistive character, and inadequate management, poultry waste, particularly feathers (which contain 90% keratin protein), has become one of the principal pollutants. As a by-product of the chicken business, 8.5 million tonnes of feathers are generated annually across the world.

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