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Environmentally controlled house for poultry

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Introduction

In recent years, the poultry industry has seen significant advancements in the design and implementation of environmentally controlled houses. These specialized structures are designed to optimize the living conditions for poultry, ensuring their welfare, health, and productivity. With a focus on improving efficiency and animal welfare, these houses have revolutionized the poultry industry, allowing for better management practices, reduced resource consumption, and enhanced profitability.

Environment-controlled housing, is a closed housing system, which facilitates an artificial microclimate to ensure optimal conditions for chickens. This includes controlling factors such as ventilation, light, temperature, and humidity. Chickens have a normal body temperature of approximately 40.6°C, so there needs to be a significant temperature difference between the poultry house and their internal body temperature. The birds' preferred temperature range for comfort is between 18°C and 25°C, with a tolerable range of 17°C to 28°C. Temperatures below 11°C and above 28°C are considered uncomfortable for them. During hot summer months, chickens pant to regulate their body temperature, resulting in energy loss, poor feed intake, and lower body weights. In colder winter temperatures, chickens increase their feed intake and expend more energy to stay warm. Extreme weather conditions in both summer and winter can lead to mortality in traditional intensive housing systems. However, with environment-controlled housing, these negative impacts can be mitigated, leading to increased productivity in chicken batches.

An environmentally controlled house should be constructed with its longitudinal axis positioned in an east to west direction, while maintaining a width of approximately 50 feet. To regulate temperature effectively, the roof of the house should be insulated to retain heat during cooler periods and reduce radiant heat during the summer. Adequate ventilation must be implemented using artificial ventilators, including various types such as cross ventilation, tunnel ventilation, duct ventilation,

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and side wall ventilation. These ventilation systems serve the purpose of removing gases like ammonia and stale air from the house, while facilitating the inflow of fresh air using fans.

Proper ventilation is crucial for maintaining optimal humidity levels and regulating temperature within the house. By ensuring air circulation over the birds, excess heat is lifted from the birds and released into the environment. It is essential to achieve complete air exchange within the house in approximately one minute. Additionally, heaters should be installed in the house to provide supplementary heat during winter months, helping to maintain optimal temperatures.

To meet the specific requirements of the house, a control panel should be installed to manage and schedule the lighting system. Broilers typically require 18-20 hours of light, while layers need 15-16 hours of light during the laying period. Automatic feeders and drinking systems should also be equipped with a control system that regulates their operation at specified intervals. A monitoring system should be in place to measure the daily feed consumption per bird. Ensuring equal distribution of feed is essential to achieve uniform body weights among the birds. The drinking nipples should be arranged at a rate of 12-15 birds per nipple to facilitate easy access to water.

Benefits of Environmentally Controlled Houses:

a. Improved poultry welfare

b. Enhanced productivity

c. Disease prevention and biosecurity

d. Resource efficiency

e. Better feed conversion

Environmentally controlled houses for poultry offer several advantages over the conventional intensive system housing. Here are some reasons why environmentally controlled houses are beneficial for poultry:

Temperature and Ventilation Control:

Environmental control systems allow precise regulation of temperature, humidity, and ventilation inside the poultry house. Maintaining optimal environmental conditions is crucial for the well-being and productivity of poultry. By providing a comfortable and stress-free environment, the controlled houses can help optimize growth rates, feed conversion efficiency, and overall bird performance.

Disease Prevention:

Environmentally controlled houses reduce the risk of disease transmission by providing a controlled and hygienic environment. These houses typically have better biosecurity measures, such as controlled entry and exit points, air filtration systems, and

enhanced sanitation practices. By minimizing the exposure to pathogens and pests, the controlled environment helps prevent disease outbreaks and reduces the need for antibiotics and other medications.

Energy Efficiency:

Modern environmentally controlled houses are designed to be energy-efficient. They incorporate insulation, efficient heating and cooling systems, and automated controls to optimize energy usage. This not only reduces operating costs for poultry producers but also minimizes the environmental impact associated with energy consumption.

Improved Feed Conversion:

Optimal environmental conditions provided by controlled houses can significantly improve feed conversion efficiency in poultry. When birds are comfortable and stress-free, they tend to consume and utilize feed more efficiently, resulting in better growth rates and reduced feed wastage.

Enhanced Animal Welfare:

Environmental control systems allow poultry producers to closely monitor and manage the welfare of their birds. By ensuring comfortable temperatures, proper ventilation, and adequate lighting, controlled houses promote better health, reduce stress, and provide a more humane environment for the birds.

Consistent Production:

With controlled environments, poultry producers can maintain consistent production throughout the year. Fluctuations in temperature, humidity, or other environmental factors can disrupt egg production, weight gain, and overall performance. By providing stable and controlled conditions, environmentally controlled houses help optimize production and minimize fluctuations.

Improved Egg Quality:

Controlled environments positively influence egg quality in terms of shell strength, yolk color, and overall appearance. Consistent environmental conditions, along with proper lighting programs, can contribute to better egg production and quality.

Challenges and Considerations:

1. Initial investment and operational costs: Balancing the benefits with the financial implications.

2. Technical knowledge and training: Proper training for farmers to effectively operate and maintain these systems.

3. Integrating automation and smart technologies: Potential for advanced sensors and automation to optimize conditions.

Conclusion:

In conclusion, environmentally controlled houses for poultry have proven to be highly beneficial for the well-being, health,

and productivity of poultry. Designed to optimize conditions for the birds, considering factors such as ventilation, temperature, humidity, lighting, and feeding. It could be a great solution for poultry production in extreme climate conditions.