

Keeping broiler houses tight saves farmers money

Electricity plays a crucial role in poultry farming – it drives the systems and equipment that create the ideal environment to keep chickens healthy and fast growing.

From lighting and heating to ventilation, cooling and electric motors that run feed lines, electricity is at the core of a productive poultry farm and, as a result, one of the most costly inputs of chicken rearing. With energy costs on a continual upward curve, it makes sense for poultry farmers to make their operations more energy efficient - any energy savings investments and measures employed today to offset rising electricity costs will be recouped in the future.

With Eskom a knowledge centre for energy efficiency, Eskom Energy Advisors specialising in the agricultural sector have found that improving insulation and optimising ventilation systems in broiler houses are crucial for curbing energy costs, particularly in winter.

“Over the years, our work with poultry farmers has demonstrated that ‘keeping broiler houses tight’ can help to improve the energy efficiency of chicken farms. At a time when farmers are faced with rising input costs, optimising energy efficiency is one of the most important steps that can be taken to reduce operating costs and remain competitive,” says Andrew Etzinger, Eskom’s Senior General Manager of Integrated Demand Management (IDM).

Eskom offers this advice to poultry farmers:

1. Keep houses tight

Heating costs are largely determined by the outside temperature and the infrastructural condition of the poultry or broiler house. Obviously, a farmer has no control over outside temperatures and, as a result, there are some limitations on how much heating costs can be controlled. Turning down the thermostat to lower house temperature is not an option because young chickens are very sensitive to temperature. The best way to reduce heating costs is to make the house as ‘tight’ as possible to stop cold air from entering or interior heat from escaping.

Houses become less energy efficient in winter when cold air is allowed to enter through wall cracks and holes, which makes the work of heating systems that much harder. Farmers can prevent heat loss by caulking sill plates and sealing cracks with expanding polyurethane foam. Holes in curtains should also be repaired to stop air leaks. All unused fan openings should be covered and sealed with plastic sheeting or curtain material. Shutters should also be kept clean.

Farmers should be aware of how “tight” their houses are so that corrections can be made before poultry production suffers and heating costs become excessive.

2. Improve insulation

Environmental controlled broiler houses with solid side walls are more energy efficient than houses that are open-sided with curtains. Regardless of the type of house, thermal insulation can be improved by ensuring that there is adequate ceiling insulation - damaged insulation in the roof or walls should be repaired or replaced. The insulation efficiency or minimum thermal resistance (R-value) of most insulation materials decreases drastically when moistened. Vapour barriers can be installed inside the brooding chamber to avoid build-up of humidity.

3. Use mixing fans to maintain uniform temperature

Warm air tends to rise to the roof and cooler air tends to descend closer to the floor where it is not needed. By using mixing fans, farmers can ensure that air is properly circulated and a more uniform temperature maintained at all levels. This not only ensures the comfort of the chickens, but it also helps to reduce the amount of energy needed to maintain temperature at optimal levels.

4. Check and maintain house controllers

Most broiler houses on commercial poultry farms are controlled by electronic devices that lose accuracy over time. To ensure the energy efficiency and desired environmental conditions for the house are maintained, timers, sensors and thermostats should be tested, cleaned and calibrated regularly.

5. Prevent moisture

Excess moisture in litter results in more heat being needed for moisture evaporation. Farmers can avoid excessive moisture build-up by properly ventilating broiler houses according to weather conditions and the age of chickens. Also attend to leaking drinking nipples immediately. Increasing ventilation rates should not be delayed, otherwise litter moisture will increase, making it more energy expensive to get rid of extra humidity - increasing ventilation rates should only be done during the warmest periods of the day.

6. Use ventilation fans properly

Ventilation fans are energy intensive and subjected to more misuse and faulty application than any other type of equipment in broiler houses. Controlling the way fans are operated can save energy. Devices such as turning vanes, airflow straighteners or splitters should be used to accommodate the air profile inside broiler houses, whilst demand changes can be accommodated by adapting the airflow with inlet vanes, outlet dampers or fan speed control. Variable speed drives should be installed on circulation and exhaust fans to improve efficiency. Farmers should make sure to match fan speed to load requirements. It is also crucial to

implement a maintenance programme. Fan components should be clean and lubricated, leaks corrected, loaded air filters replaced, and belts and drive shafts aligned for optimal efficiency.

For winter and beyond, installing energy efficient technologies is by far the most effective way for farmers to cut and control electricity costs. Lighting is often neglected as an energy saving opportunity, yet measurable savings can be achieved by understanding the lighting requirements of a broiler house, analysing inefficiencies and replacing conventional lighting systems with energy saving technology solutions.

According to Etzinger, Eskom Energy Advisors collaborated with an Energy Services Company (ESCO) to overhaul lighting systems at Kromme Rivier Poultry Farm in the Western Cape. The lighting retrofit in eight 15 000-chick sheds comprised:

- Replacing 256 x 60W incandescent globes with 6W LEDs; and
- 2 x 125W Mercury vapour floodlights with 20W LEDs.

This intervention has seen the farm reduce energy consumption by 51 226 kWh per annum, which translates into energy cost savings of R60 053 per annum (at 2012 electricity tariffs).

Other energy efficient technologies poultry farmers can consider installing to achieve energy savings include:

- Variable speed drives on conveying and ventilating systems.
- Energy efficient fans.
- Solar water heating or heat pump systems for hot water requirements.
- Photovoltaic systems to generate and supply power to farms.

“Before commencing with any retrofit, farmers should first conduct an energy audit to identify opportunities to save energy, determine where energy is being wasted, and prioritise energy saving initiatives based on available budgets, the cost and availability of technologies, the scale of an envisaged retrofit, and its feasibility within the framework of a particular farming operation,” advises Etzinger.

Eskom’s Energy Advisors have forged strong relationships over many years with leading Energy Services Companies (ESCOs) and energy efficient technology suppliers. Together they support farmers with:

- Understanding and having access to the latest energy efficient technologies;
- Analysing the energy consumption of farms or specific processes on farms;
- Identifying areas of energy wastage on farms;
- Assessing the current and future energy needs of farms; and
- Identifying the most cost effective and energy efficient technology solutions for farms.

Call 08600 37566 and ask to speak to an Eskom Energy Advisor.

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