Energy Forum

Queensland Chicken Growers Association

6 July 2017

Part of the Energy Queensland Group

Energy Savers Program

Objective

… assist farmers reduce energy costs by supporting the accelerated adoption of improvements in on-farm energy use.

Outcome

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The journey….

- 120 audits completed
- 22% implementing
- Further 25% strong likelihood to implement
- 6 chicken meat farm audits

Production Critical performance measures

- Water quality
- Food quality
- Indoor Shed Environment - temperature & upper humidity
  - 11-26 degrees optimal, humidity <80% causes distress
- Indoor Shed Environment – Lighting and timeframe
  - Birds need protection from direct sunlight, excessive wind, heat and cold variation
  - Lighting 24 x 7 first 2 days then slowly reduced to a cycle of 4 hrs on and 2hrs off over 24hr period
- Bio Security and disease control
  - mortality rate may rise due to disease, predation or high temperature. 4% mortality rate of small chicks (8wks)

Findings

- **Electricity Cost Density - allocated bird varies from $0.12- $0.47 for chicken meat sites.**
- **There is a definite correlation between yearly average temp and energy cost. Cooler climates are proven to use less energy which is mainly around fan power**
- **Measured fan performance 0.187 to 0.132 W / LPS**
- **Tunnel ventilation is more efficient because it requires less air volumetric flow rate.**
  - **Target 3 M/S tunnel area generally 12M x 3M =36 SQM @ 3 M/S.**
  - **Cross flow ventilation less efficient. Target 3M/S. Cross area generally 110M X 2.7M = 297 SQM @ 3M/S.**
- **Energy savings range from 6 to 78% (typically 20 - 30%)**
- **electricity cost per farm typically $40,000-$80,000p.a. With average consumption 150,000 - 300,000kWh**

Findings continued

- **Power peak profiles always occurred during the midday - 2pm and power is reduced at night**
- **Operation 15 - 25 years, some build on's**
- **Canvas construction is leaky and suitable for natural ventilation only**
- **Roof /Wall – 100mm panel performed the best. Cost for roof panel over 100mm diminished in ROI**
- **Of sites audited E-W orientation tended to provide reduced heat load and reduced fan power, assisted with prevailing breezes. Orientation is location specific.**
- **Spacing between buildings is recommended to be at least 1.5 times the height for natural ventilation**

Solutions

- **Ensure you are on the correct tariff**

- **Ventilation- typically 55-65% of shed energy use**
  - **Fan selection, fan power and operation critical**
  - **EC fan technology allows for variable speed and starts at 0.073 W /LPS**

- **Tunnel ventilation should target 3M/S with all fans ramping depending on heat load**

- **solar PV an opportunity to fight day peak and battery storage in coming years, 30kw system**

- **PFC an opportunity if account is large enough >80KVA**

Solutions continued

- Lighting can offer small savings with LED. Room lighting density is mostly 10 lux which doesn't allow for significant savings
- If you have pumps for water and storage – do during off peak times where possible, depending of age of pumps consider VSD's
- Staggering or staging feed allocation between multiple sheds can reduce overall max demand …6-10% on total shed demand – don't mill during middle of day (one site)
- Using simple timers to prevent heaters or non critical process form occurring between 11am and 3pm where the site peak usually occurs – one site saved 18kw/day by turning off heaters for 4hrs a day
- pump timers and VSD's where applicable

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