


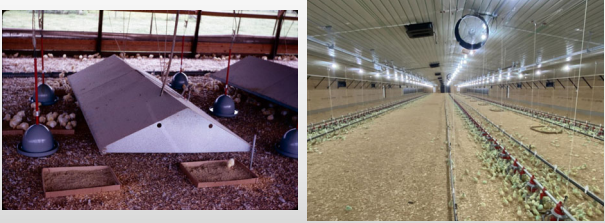

Poultry House Tightness

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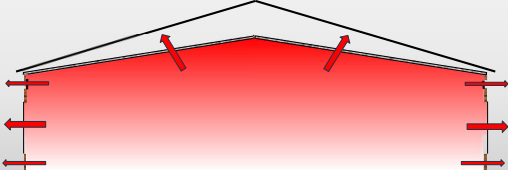

Modern poultry house design has had energy efficiency in mind as it evolved

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Especially by decreasing heat loss in areas.

- ▶ Heat energy is always going to move from hot to cold
- ▶ Energy balance in the house
 - ▶ Heat in (added) = Heat out (lost) : to keep the internal temperature constant

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Decrease in heat loss because...

- ▶ Improved insulation in ceiling, side walls, and end walls.

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Decrease in heat loss because...

- ▶ Improved insulation in ceiling, side walls, and end walls.
- ▶ Insulated tunnel doors, and sidewall inlets

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Decrease in heat loss because...

- ▶ Improved insulation in ceiling, side walls, and end walls.
- ▶ Insulated tunnel doors, and sidewall inlets
- ▶ Totally enclosed sidewalls

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Where is the area of most heat lost from the house?

- Modern totally enclosed 50x500 ft house.

Category	Percentage
Ventilation & Leakage	80%
Tunnel Curtains/Door	4%
Brooding Curtains	2%
Endwall	2%
Side wall below curtain	4%
Side wall above curtain	2%
Ceiling	7%

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What about a house with curtains?

- Curtain sided 50x500 ft house.

Category	Percentage
Ventilation & Leakage	74%
Tunnel Curtains/Door	4%
Brooding Curtains	2%
Endwall	2%
Curtain	9%
Side wall above curtain	2%
Side wall below curtain	4%
Ceiling	7%

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If most loss is through ventilation and leakage how do we maximize energy conservation?

▶ We improve house tightness.

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Poultry houses are designed for air to enter through inlets

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We want as much as possible to enter through air inlets...

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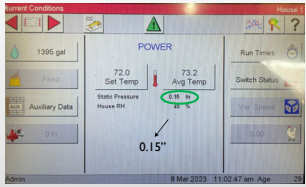
Evaluating house tightness

- ▶ Magnehelic static pressure gauge
 - ▶ Dwyer Model 2000-00 (\$100)
 - ▶ Digital meters (\$300)

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Conducting a house tightness test

- Should be conducted on a calm day
- Close all inlets (side wall & tunnel)
- Turn on 1 CFM for every sq.ft. of floor space
 - 20,000 ft2 house use 1 48" fan or 2 36" fans to get 20,000 cfm
 - Use the fans with the best belt and pulleys (usually not the fans that turn on first)
- Measure static pressure
 - Controller or Magnehelic Gauge



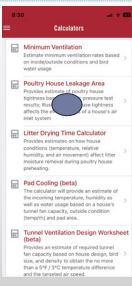
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The easiest way to quantify house tightness is to use the Poultry411 App: House tightness calculator

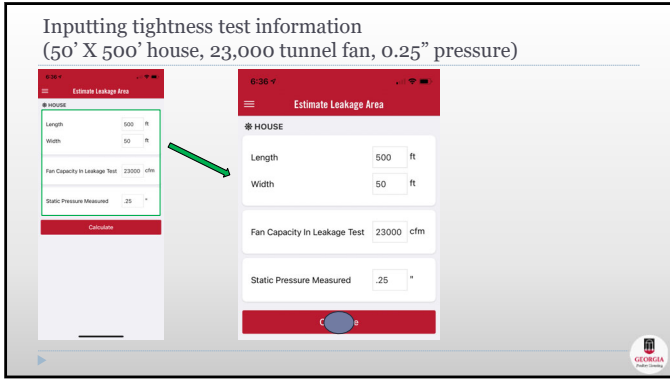


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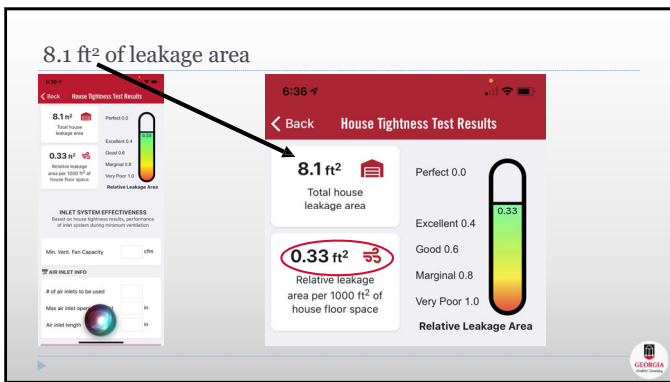
Poultry House Leakage Area/Tightness App



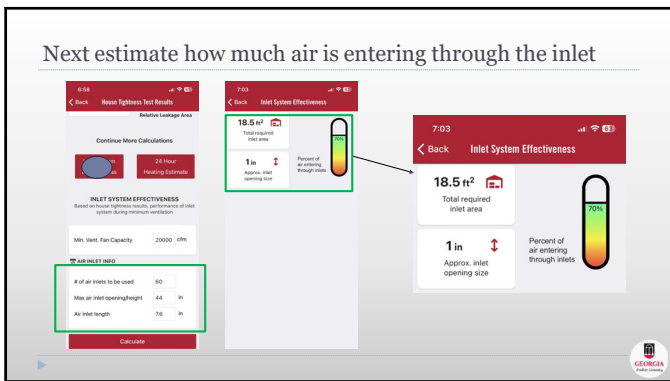
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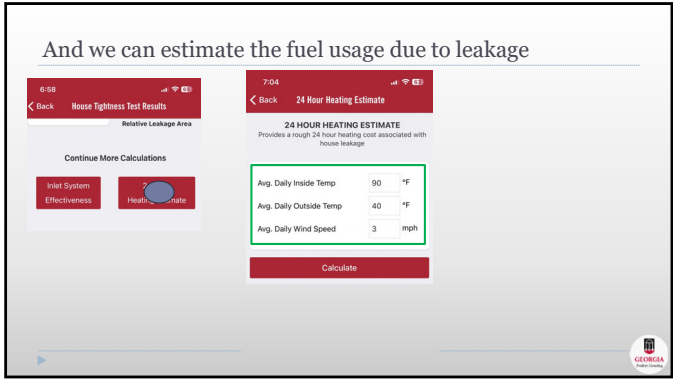
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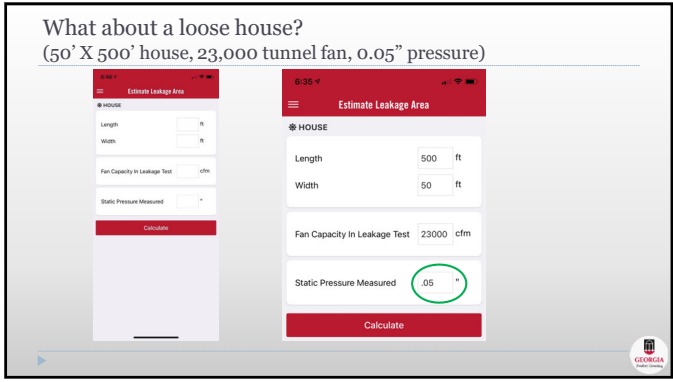
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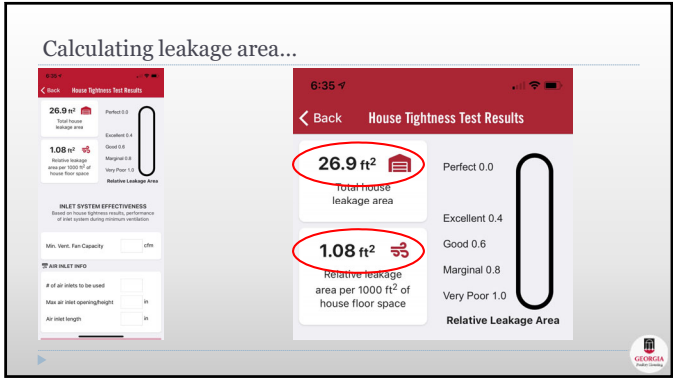
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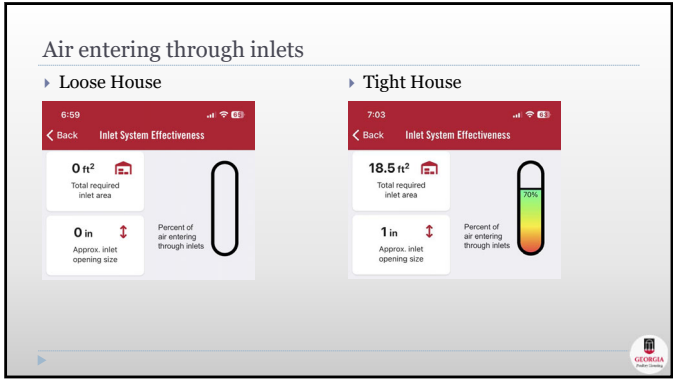
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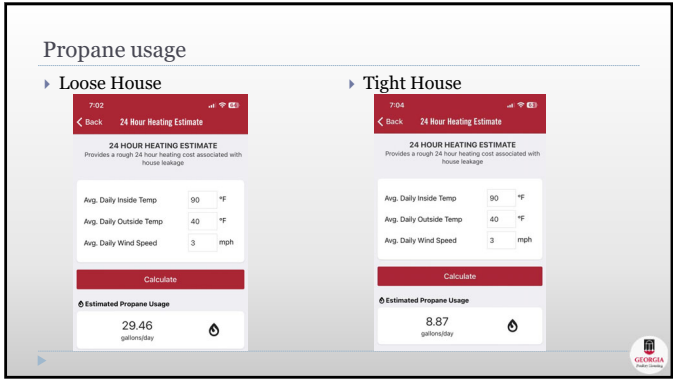
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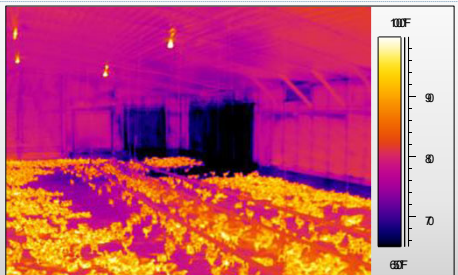

If the house is loose...

- ▶ Use an insect fogger to find where it is
 - ▶ Turn on a couple of fans (with inlets and tunnel curtains/doors closed)
 - ▶ Walk around exterior of house with insect fogger
 - ▶ Someone inside makes notes of where the smoke/air is entering the house.



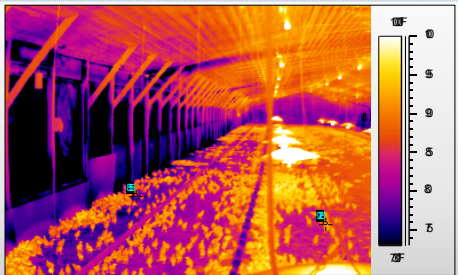


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Thermal camera to evaluate areas of house leakage

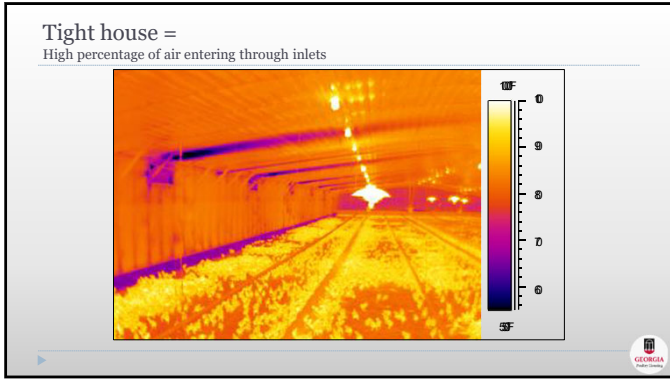



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Loose house =
Low percentage entering through inlets

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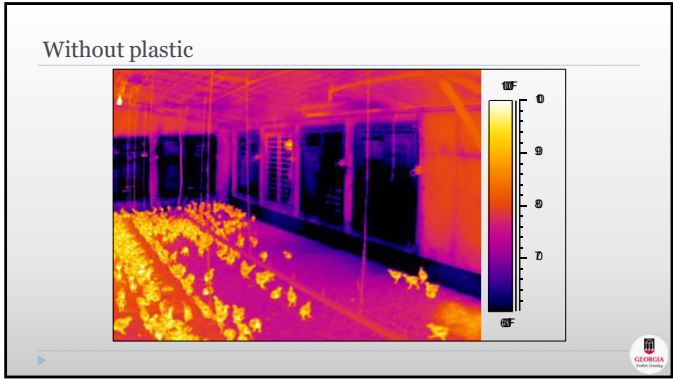
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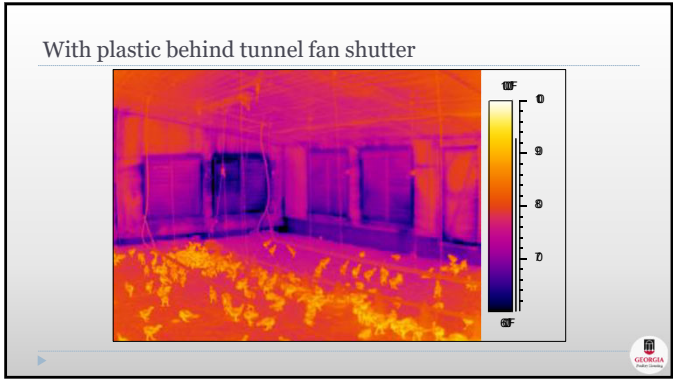
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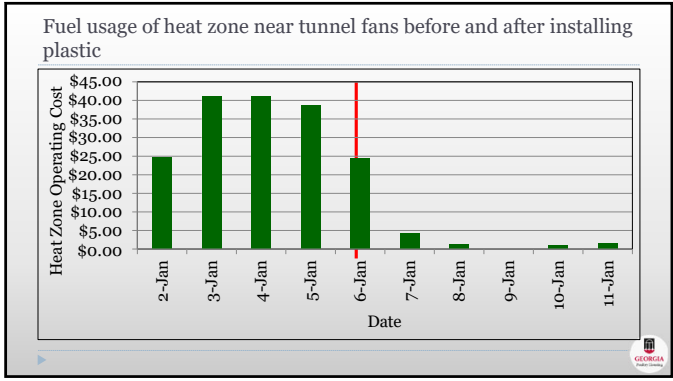
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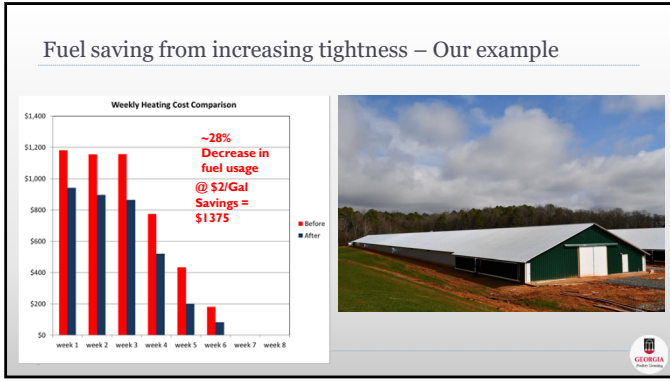
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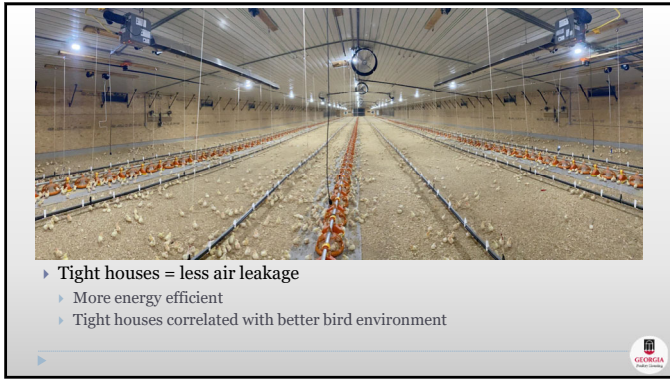
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The slide features the logo of the University of Georgia, established in 1785, and the text: "Department of Poultry Science", "College of Agricultural & Environmental Sciences", and "UNIVERSITY OF GEORGIA". Below this, there is a Facebook icon followed by "UGA Poultry Housing" and the website "Poultryventilation.com".

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