

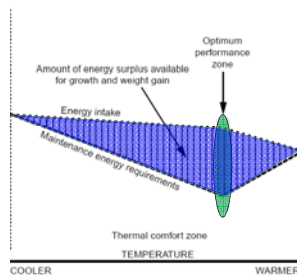
The Importance of Temperature Control in Layer Facilities

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Tunnel Ventilation

- ▶ There are three primary goals of a tunnel ventilation system:
 - 1) Remove heat from the house.
 - ❖ Provide adequate air exchange
 - 2) **Remove heat from the birds.**
 - ❖ **Produce proper air velocity over the birds**
 - 3) Reduce the temperature of incoming air.
 - ❖ Adequate evaporative cooling system

Temperature Zone & Performance



Physiological Responses to Heat Stress

- ▶ Increased respiration, more shallow
- ▶ Respiratory alkalosis
- ▶ Adrenal cortical & Adrenal medullary response
- ▶ Kidney response
- ▶ Increased heart rate
- ▶ Vasodilation
- ▶ Increased pancreatic activity
- ▶ Increased body temp set point
- ▶ Decreased immune response



Heat Stress Behavior

- ▶ Decreased feed intake
- ▶ Increased water consumption
- ▶ Decreased activity
- ▶ Spread and drooped wings
- ▶ Feather ruffling
- ▶ Seeking cooler places
- ▶ Burrowing in litter
- ▶ Increased respiration rate
- ▶ Increased fecal excretion (Diarrhea/Flushing)

When Temperature gets above the thermoneutral zone...

- ▶ Birds will begin to pant



Panting

- ▶ Method of evaporative cooling for birds
 - ▶ Gular flutter
- ▶ Requires energy
- ▶ Respiratory Alkalosis
 - ▶ Increased blood pH
 - ▶ Thin egg shells and reduced bone deposition
- ▶ Dehydration
- ▶ Increased water consumption

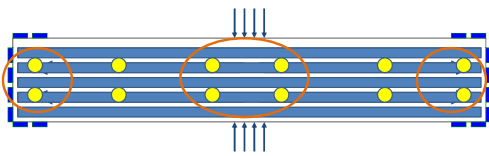


Reduced Performance

- ▶ Reduced Growth
- ▶ Increased disease susceptibility
- ▶ Reduced immune response
- ▶ Reduced Egg production
- ▶ Semen quality reduced
- ▶ Reduced fertility
- ▶ Poor feed conversion
- ▶ Thin egg shells
- ▶ Reduced livability
 - ▶ Heat exhaustion

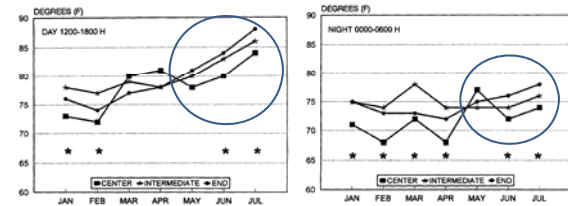


Temperature Effects on Egg Size



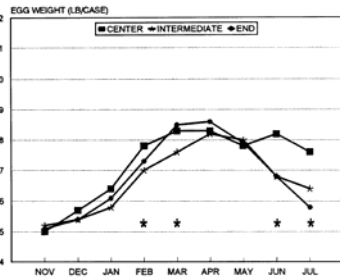
Temperature Differences in the House

- ▶ Egg size can vary with location within a house
 - ▶ Larger eggs associated with bottom tier of cages



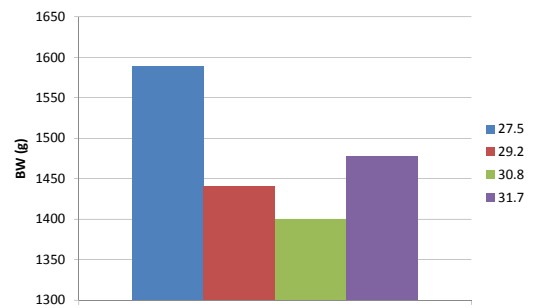
Egg Size

- ▶ Egg size can vary with location within a house

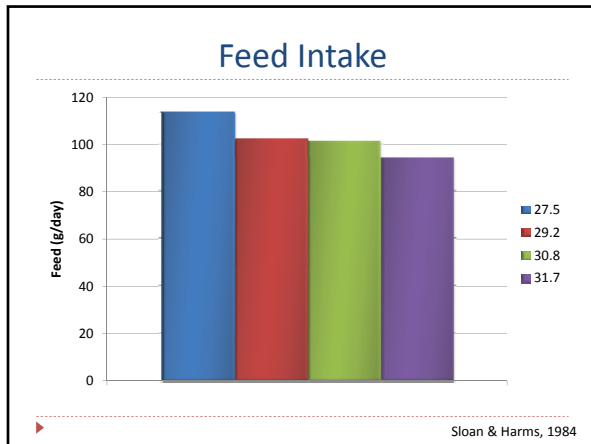


- ▶ Larger eggs associated with bottom tier of cages

Body Weight



Sloan & Harms, 1984

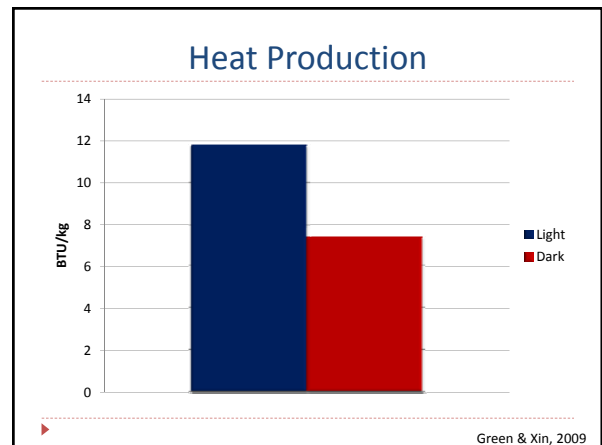


White Leghorn Heat Production

- ▶ Heat production
 - ▶ Approximately 10 BTU/Kg (4.5 BTU/lb)
 - ▶ Affected by a number of factors

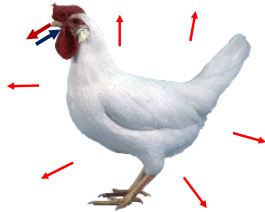
Factors Affecting Heat Production

- ▶ Bird Density
- ▶ Fasting or Feed Restriction
- ▶ Light or Dark Period
- ▶ Egg Development
- ▶ Stocking Density
- ▶ Oviposition

How do Birds Lose Heat?

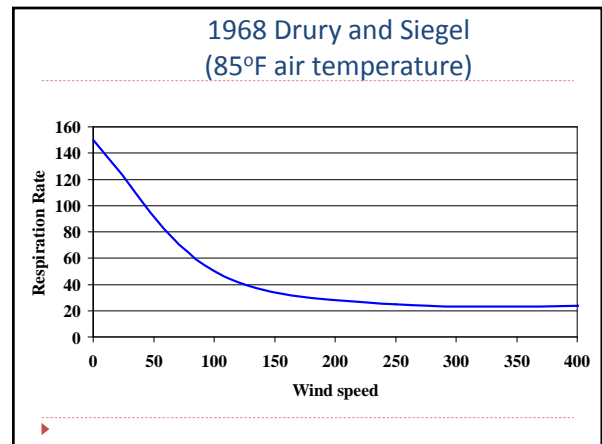
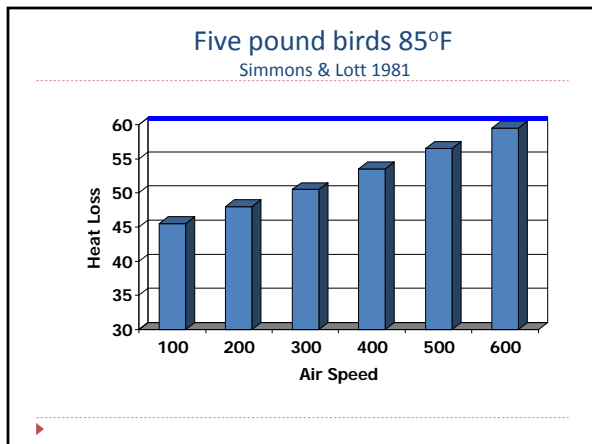
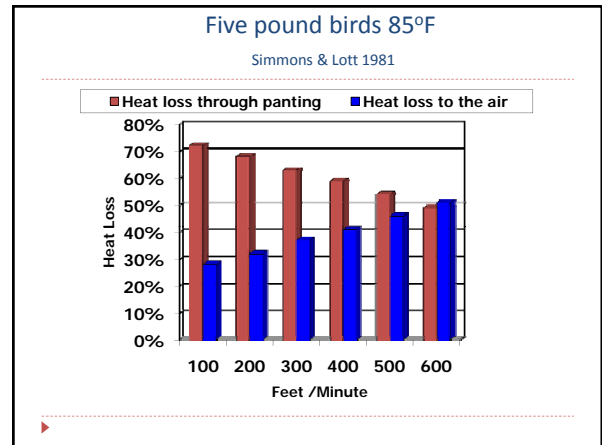
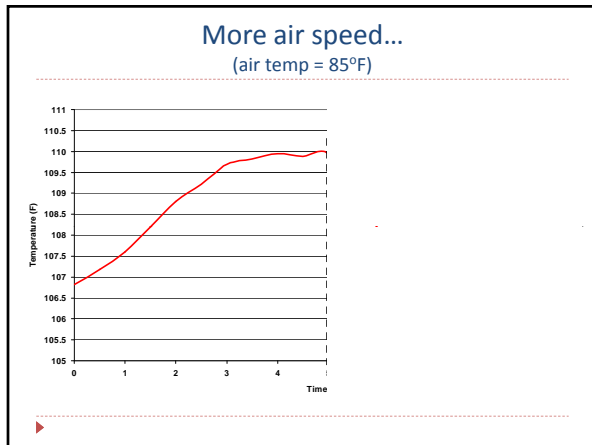
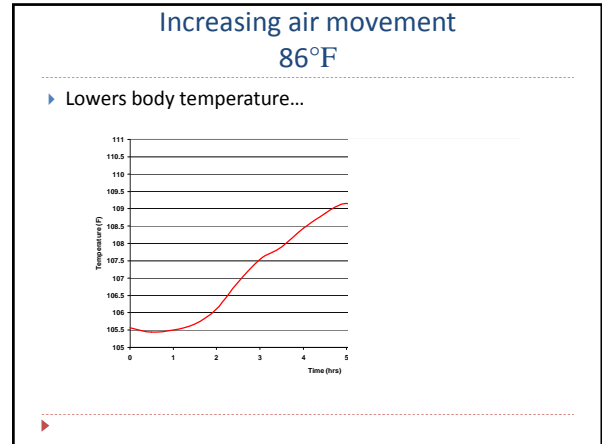
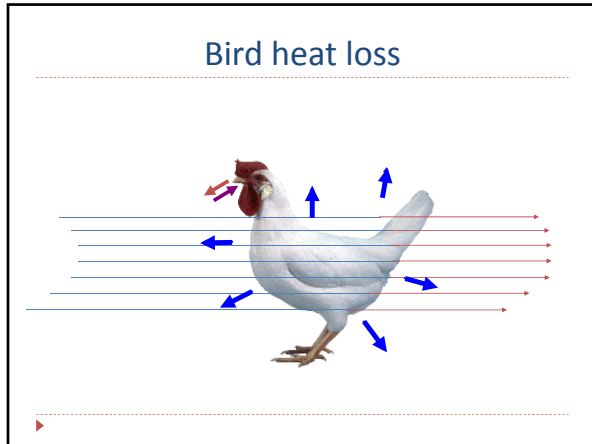
- ▶ Radiation
- ▶ Conduction
- ▶ Evaporation
- ▶ Convection



Air movement

- ▶ Moving air over a hot object removes heat from that object...





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www.poultry.uga.edu
www.poultryventilation.com