An Investigation of Heat Lamps
ARE THEY ALL THE SAME!?!?

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Objective

- To determine if there is a difference in quantity of heat produced from different heat bulbs available on the market, different reflectors, and if cleanliness of bulbs matters
  - Are we using the best heat lamp setups?
Project

• To compare quantity of heat produced from:
  – 4 different heat bulbs
  – 3 different lamp shades
  – 3 different scores of bulb cleanliness
  – 2 different flooring surfaces
Methods

• Temps measured with infrared temp gun
  – Gun was held at a constant 20 inches off the ground
  – Piglets kept off flooring for at least 5 minutes
• Lamps turned on for 15 minutes for warm up prior to measurement
• Measured temperatures over 10 seconds
  – Took an average
• Pig level temps taken by 3 averages with a temperature pen (didn’t seem accurate)
• Pig behavior was scored after 15 minutes of warm up time
Bulbs Evaluated

- “Infrared heat bulbs”
  – 125 watt bulbs used on most farms
- “Philips heat bulb”
  – 100 watt bulb
- “Sylvania Comfort Zone 20”
  – 100 watt bulb
- “Infrared Heavy Duty Hard Glass Heat Bulb”
  – 175 watt bulb
Infrared Heat Bulbs

- 125 W
- $1.83/bulb
- Most commonly used heat bulb in farrowing rooms
Phillips Heat Bulb

• 100 W (supposed to produce the heat of a 125 watt bulb)
• $5.40/bulb
• The Philips Bulb is supposed to be heavier duty and more resistant to water splashes
Sylvania Comfort Zone 20

- 100 W (supposed to produce the heat of a 125 watt bulb)
- $5.43/bulb
- Supposed to provide a larger zone of heat due to new lens technology
Infrared Heavy Duty Hard Glass Heat Bulb

- 175 W
- $3.02/bulb
- Some farms using these larger bulbs
  - Depending on if electrical wiring can handle it
  - Others use them in fronts and backs of rooms
Reflectors Evaluated

Traditional Metal Reflector
$10.06

Plastic Reflector
$15.49

Hi-Lo Adjustable Reflector
$29.94
Bulb Zone of Heat on Black Mat - Using Metal Reflectors

Temperature vs. Inches from center graph showing the heat distribution for different types of heat bulbs:

- Infrared Heat Bulb (1)
- Infrared Heat Bulb (2)
- Phillips Heat Bulb
- Sylvania Comfort Zone 20
- Infrared Heavy Duty Hard Glass 175W (2)
Effect of Bulb Cleanliness on Heat Produced
125W Infrared Heat Bulbs, Metal Reflectors

- Subjective Bulb Scores
  - 1 = new
  - 2 = a little dirty
  - 3 = more dirty
  - 4 = very dirty (non-available for testing)
  - 5 = black (non-available for testing)
Bulb Zone of Heat on Black Mat - Using Plastic Reflectors

- Infrared Heat Bulb (2)
- Phillips Heat Bulb
- Sylvania Comfort Zone 20
- Infrared Heavy Duty Hard Glass 175W (1)
Metal vs. Plastic

Bulb Zone of Heat on Black Mat - Using Metal Reflectors

- Infrared Heat Bulb (1)
- Infrared Heat Bulb (2)
- Phillips Heat Bulb
- Sylvania Comfort Zone 20
- Infrared Heavy Duty Hard Glass 175W (2)

Bulb Zone of Heat on Black Mat - Using Plastic Reflectors

- Infrared Heat Bulb (2)
- Phillips Heat Bulb
- Sylvania Comfort Zone 20
- Infrared Heavy Duty Hard Glass 175W (1)
Bulb Heat Produced with Hi/Low Reflector

- Infrared Heat Bulb (Low)
- Infrared Heat Bulb (High)
- Phillips Heat Bulb (Low)
- Phillips Heat Bulb (High)
- Sylvania Comfort Zone 20 (Low)
- Sylvania Comfort Zone 20 (High)
- Infrared Heavy Duty Hard Glass 175W (Low)
- Infrared Heavy Duty Hard Glass 175W (High)
Cardboard Temperatures (nearest to mat)

**Metal Reflector**

- Infrared Heat Bulb
- Phillips Heat Bulb
- Sylvania Infrared Comfort Zone 20
- Sylvania Infrared 175W (2)

**Plastic Reflector**

- Infrared Heat Bulb (2)
- Phillips Heat Bulb
- Sylvania Comfort Zone 20
- Sylvania 175W (1)
Also looked at the Scorpion III

$23.98/unit
Bulb
  ○ 1 Halogen 250 W bulb
  ○ $4.99/bulb
The Scorpion III heats two litters with only one bulb
The Scorpion® III provides a rectangular heating pattern
Scorpion III

- Data not included with other bulbs
  - Provides a different shape of heat
  - Results (generalized)
    - Good heat production on 1 side
    - Poorer heat production on the other side

Scorpion III - Heat Production

![Graph showing temperature distribution for Scorpion III heat production in crates 1 and 2.](image)

Temperature (measured along the divider, not towards the sow)
Air Temperatures

- Used temperature/humidity pen to evaluate temperature at 6 inches above mat
  - In general temperatures were ~10 degrees lower than mat temperatures
  - But readings were inconsistent
Take Home Points

• All bulbs aren’t created equal
• Bulbs and reflectors matter
• In this set of experiments
  – The 125W Infrared bulbs and the 100W Philips bulbs outperformed the others
  – 100W Philips bulbs generally provided more heat than the 125W Infrareds
    • ~ 10-15 degrees with plastic reflectors
    • ~ 5 degrees with ho-low reflectors
  – Philips bulb was by far the most impressive overall with piglet behavior also (less piling piglets)
100W Philips Bulbs

• Do cost more
  – $5.40 vs. $1.83 (125W Infrared)

• But use less electricity
  – 100W vs. 125W

• Per 192 bulbs (roughly 1,000 sows equivalent)
  – Replacement = 5.75 month payoff (breakeven)
  – $11.50 saved over the life of each bulb
    • $7.93 saved on each replacement bulb
  – $1,522.56 savings/year on 192 bulbs

• Assumptions
  – 5,000 hour life for each bulb
    • Philips is supposed to be heavier duty, last longer, and be more resistant to water splashes
  – Electricity cost of 0.092 $/kWh
  – 164 hours of operation/week average

Change everything tomorrow?

• No, but worthwhile to try some Philips bulbs in your barn
  – Check temperatures of current bulbs vs. Philips
• Don’t have any information on life of bulbs or performance of dirty Philips bulbs
Other Take Home Points

• The 175W bulbs were a big disappointment
  – Could be farm specific? Wiring?
• If using 175W bulbs, highly recommend checking mat temperatures
  – Are they really producing more heat?
Take Home Points

• Hi/low reflectors significantly improved performance of all bulbs (5-15 degrees)
  – No experience with these, but also worth evaluating

• Bulb cleanliness matters
  – Keep ‘em clean!
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