Background:
• After years of research Purdue teams have developed a cooling pad to be used in farrowing buildings that can lower discomfort of the sows and potentially increase productivity.

Problem Statement:
• Purdue Animal Science and ABE need a system for their Hog Cooling Pad project that recycles the warm water from the cooling pads instead of discharging it as waste.

Criteria:
• Design a closed system that recirculates the water
• Design should be available for both new and existing buildings
• Choose from a variety of given systems

Impact:
• Reduce sow loss
• Increased sow feed intake
• Increased pig wean weight
• Potential decreased of weaned pig loss

Future Validation Tests:
• Place three temperature sensors on loop between pads
• Temperature sensor on entering and exiting pad water
• Flow meters on each pad

Solution:
• Air cooled water chiller
• Most efficient and economical option
• Most easily placed in new or existing buildings
• Life span of 15+ years

Economic Analysis:
• Average cost per pad - $280
• Chiller cost per crate - $376 (240 pads)
• If average piglet per litter increases by 0.5 pigs the system is financially viable
• Rate of return on system is 1-2 years with potential decrease in piglet loss
• System is not financially viable if increased sow longevity/ decreases sow loss are the only found advantages with the system

Decision Matrix

<table>
<thead>
<tr>
<th>Solutions</th>
<th>Safety</th>
<th>Sustainability</th>
<th>Cost</th>
<th>Management</th>
<th>Viability</th>
<th>Score</th>
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<tbody>
<tr>
<td>Vertical Geothermal</td>
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<td>8.5</td>
<td>3.4</td>
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<tr>
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<td>2.6</td>
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<td>0.95</td>
</tr>
</tbody>
</table>

Chiller Cost Per Crate

Economic Analysis:
- Average cost per pad - $280
- Chiller cost per crate - $376 (240 pads)
- If average piglet per litter increases by 0.5 pigs the system is financially viable
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Acknowledgements:
- Martin King, Legacy Chillers