

**Title:** Zone Heating for Wean-to-Finish Facilities: A Performance Comparison - **NPB #02-194**

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**Abstract:** Farm research trials were conducted in 2003 and 2004 to assess the effects of the type of zone heater and floor mat used in a wean-to-finish building on the thermal environment created for newly weaned pigs and resulting pig performance. Modulated LP gas-fired brooder heaters were compared to electric heat lamps, and floor mats made from farm-cut wood sheathing (3/8" oriented-strand board, OSB) were compared to commercial [unheated] rubber mats in a replicated 2x2 factorial experiment. No consistent differences in air temperature near the heating zone were found between either of the treatments, with treatment means within 1 °F of each other in both trials. In pens having modulated gas-fired heaters, black-globe temperatures just outside the heating zone were consistently warmer (+2-2.5 °F,  $P < 0.05$ ) than in pens with heat lamps. Black-globe temperatures were also warmer in pens with OSB mats (+0.5-2 °F) than in pens with rubber floor mats. Conversely, the temperature of exposed mat surface area was warmer (93.9 °F vs. 86.3 °F on average,  $P < 0.001$ ) under the heat lamps than under the brooders. However, no significant difference was found in pig dorsal surface temperature. There was some evidence ( $P < 0.10$ ) that the temperatures of exposed mat surface areas were slightly warmer with rubber mats than with OSB sheathing (91.4 °F vs. 88.9 °F), but no corresponding difference in pig surface temperatures was found.

Overall, no statistically significant treatment differences in pig performance were found at the end of the zone-heating periods. Slightly higher rates of gain during the first week were found in pens using modulated gas-fired brooders than with heat lamps, but this advantage was not sustained. Time-lapse video footage helped document pig activity, but any differences that may have existed in pig activity did not noticeably influence performance. Daily energy consumption rates averaged 0.025 gal/pig/d for the LP gas-fired brooders and 0.40 kWh/pig/d for the electric heat lamps. For electricity prices ranging from 6 to 12 ¢/kWh and LP gas prices of \$0.70-1.40/gal, annualized equipment & operating costs varied from \$1.26 to \$2.26 per pig place for electric heat lamps and \$2.26 to \$3.00 for the gas-fired brooders. Unless gas prices are low relative to electric rates, or some other financial benefit is obtained by using gas-fired brooders, heat lamps would appear to have an economic advantage for producers due to their lower unit fixed cost in equipment.

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