

**Title:** Comparing Heat Lamp vs. Heat Mat for Farrowing Crate Heating – NPB #12-191

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### Scientific Abstract

Heat lamps and heat mats are the two main types of supplemental heat sources used to provide localized heating to pre-wean piglets in modern swine farrowing systems. Both localized heat sources aim to provide a warmer microenvironment for the piglets while allowing the room conditions to suite the sow's thermal needs. Previous work has shown that localized heating in farrowing operation is the most non-feed energy intensive phase in swine production; and new systems offer the possibility of reducing electricity consumption. However, the new heating system's effects on piglet performance (rate of gain, mortality) must be quantified. For this study, three 40-crate farrowing rooms were equipped with 125W heat lamps in half of the crates and 290W 0.6m x 1.5m (2ft x 5ft) double heat mats shared between two crates in the other half of the crates. A temperature dependent, variable output controller regulates the power supply to the mats. The lamps were controlled on/off by the room ventilation system controller and turned off when the room temperature exceeded the set point by 5.5°C. Electricity use of each half of the rooms was measured separately with electric meters. Piglet performance was recorded by farm personnel and our research group. Additionally, infrared thermography cameras were deployed for a 24-hr period several times during the lactation period to capture the piglet behaviors. Average body weight gain (AWG, mean  $\pm$ SE) of piglets in the mat and lamp regimens was, respectively, 224 ( $\pm$ 5.7) g/d and 220 ( $\pm$ 5.9) g/d. Prewean mortality (mean  $\pm$ SE) for the mat and lamp regimens were, respectively, 7.8% ( $\pm$ 0.4%) and 7.4% ( $\pm$ 0.5%). Electricity use (mean  $\pm$ SE) for the mat and lamp regimens was respectively, 0.66 ( $\pm$ 0.06) kWh and 1.05 ( $\pm$ 0.04) kWh per kg weaned pig. Overall, the heat sources were occupied for 58% and 56% of the time for mats and lamps, respectively. When the heat source was utilized, at least two piglets were present 76% and 87% of the time for mats and lamps, respectively. Overall, the mats and lamps performed similarly except for power use.

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