

Independent Study 490A: Do Gilts Adapt to a Confined Farrowing Stall After Being Housed in a Loose Deep Bedded Gestation Environment?

A.S. Leaflet R2544

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Summary and Implications

Gestation stalls will be banned in the European Union by 2013. Similar legislative pursuits are occurring in the U.S. However, little work has addressed the sows' behavioral adaptation from a loose housed gestation environment to a more confined farrowing / lactation environment, and in turn if this has any adverse effects on her overall behavioral repertoire and performance. Therefore, the objectives of this study were to compare gilt behavior and performance over lactation after gilts had been housed in a deep bedded gestation hoop. The project was approved by Iowa State University's Institutional Animal Care and Use Committee. A total of 10 Duroc gilts (163.8 kg to 200.1 kg) were observed over lactation. Gilts were group gestated in one pen in a hoop barn. Gilts were moved into farrowing stalls, 5 d before predicted farrowing. A total of 10 stalls were used during this trial (containing one gilt) and the gilt was the experimental unit. **Behavioral data;** were collected by live observation using a 5-min scan sample over a 4-h period in the morning (0700-1100) on day 0, 7, 14, and 21 of being housed in the farrowing stall. Two postures (active [summation of standing, stepping, eating and drinking] and inactive [summation of sitting and lying]) and one behavior; nursing were collected. **Performance measures;** Total number of piglets born, born alive, stillborn, pre-weaning mortality and weaned were recorded. Stillborns were defined as any piglet found dead during or shortly after farrowing and had not breathed. Mummies were classified if they had one or more of the following characteristics: rubbery skeleton, bloated stomach, lack of hair, brown or black body color, sunken eyes, loose skin or bad odor. **Statistical Analysis:** Behavior and performance data will be presented descriptively. On the first day when gilts were placed into the farrowings stall, gilts engaged in almost 80 % of their time budget in an inactive state (which was the summation of sitting and lying). There were no reports of nursing as no gilts on d 0 had piglets. By day 7, a portion of inactive time had been shifted over into nursing related behaviors, and for the remainder of the time in lactation gilts spent about 60 % inactive, 25 % nursing and the remainder active (15 %). All gilts farrowed by the ninth day in the farrowing unit. The average number born was 9, born alive 7.55, stillborn, 1.36, number that died before

weaning, 0.82 and weaned 6.73 respectively. Therefore in conclusion, gilts behaviorally adapted to the farrowing stall and their performance was not negatively affected, even after being housed in a deep bedded loose housed environment for gestation.

Introduction

Gestation stalls will be banned in the European Union by 2013. Similar legislative pursuits are occurring in the U.S. In 2003 Amendment 10 in Florida banned the gestation stall, which came into effect November 2008. Proposition 204 in Arizona (2006) will come into effect January 1st 2013. Oregon (SB 694) followed suit in 2007. In May, 2008 Bill SB, 201 was signed by the Governor of Colorado that will phase out the gestation and veal stalls. This act will phase out veal stalls within four years and gestation stalls within 10 yrs. Colorado is now the first state in the country to ban the use of gestation crates and veal crates by action of a state legislature. In 2008 Prop 2 was passed in California. Although the American Veterinary Medical Association (AVMA), the National Pork Board and researchers have noted that all gestation systems have their benefits and challenges, little work has addressed the sows behavioral adaptation from a loose housed gestation environment to a more confined farrowing / lactation environment, and in turn if this has any adverse effects on her overall behavioral repertoire and performance. Therefore, the objectives of this study were to compare gilt behavior and performance over lactation after gilts had been housed in a deep bedded gestation hoop.

Materials and Methods

Animals and location: The project was approved by Iowa State University's Institutional Animal Care and Use Committee. A total of 10 Duroc gilts (163.8 kg to 200.1 kg) were observed over lactation. Gilts were obtained from a single source farm that had a history of producing pigs serologically negative for PRRSv (Porcine Reproductive and Respiratory Syndrome virus) and *Mycoplasma hyopneumoniae*. The study was conducted over the spring, 2007 at the Lauren Christensen Swine Research facility in central Iowa.

Gestation: Gilts were group gestated in one pen in a hoop barn. Pens had feeding stalls (feed once daily at 0800 h) along one side and a waterer on the other side. Pens were deep bedded with oat or wheat straw and corn stalks. Gilts were checked twice a day (0800 and 1600 h) by the

caretaker. Gilts were moved into farrowing 5 d before predicted farrowing.

Figure 1. Hoop barn for gestation with feeding stalls.



Farrowing and lactation; Gilts were loaded onto a hydraulic trailer and moved to the farrowing house. They were washed room prior to entry into their farrowing stalls. Farrowing stalls measuring 2.1 · 0.6 m with a 2.1 · 0.46 m creep area. The farrowing room consists of 12 stalls, 6 on each side.

The gilts were fed twice per day (0630 and 1530). All gilts were on a limited diet, starting at 1.36 kg per feeding, until they farrowed. This increased up to 7.3 kg per feeding during lactation (on a per gilt basis). The ground corn-based diet met or exceeded the NRC (1998) requirements. Water was provided on an *ad lib* basis via a nipple waterer attached to the stall. Gilts were not induced to farrow, but were given penicillin per label recommendations the morning after they farrowed. Heat mats were placed on either side of the gilt. Piglets were ear notched, tails were docked, teeth clipped, and piglets cross fostered within 24-h after birth. The male piglets were not castrated, as some of these were used as replacement boars.

Figure 2. Farrowing stalls for birth and lactation.



Treatments and experimental design: A total of 10 stalls were used during this trial (containing one gilt) and the gilt was the experimental unit. Caretakers observed all sows twice daily, at 0600 h and 1600 h.

Behavioral acquisition: Behavioral data were collected by live observation using a 5-min scan sample over a 4-h period in the morning (0700-1100) on day 0, 7, 14, and 21 of being housed in the farrowing stall. Two postures (active

[summation of standing, stepping, eating and drinking] and inactive [summation of sitting and lying]) and one behavior; nursing were collected.

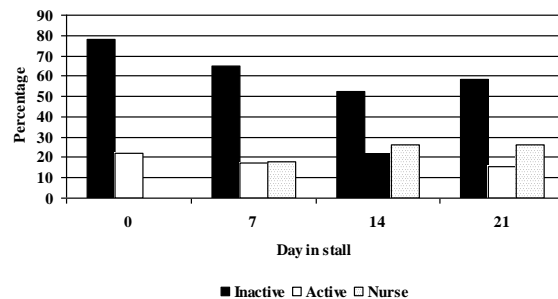
Performance measures: Total number of piglets born, born alive, stillborn, pre-weaning mortality and weaned were recorded. Stillborns were defined as any piglet found dead during or shortly after farrowing and had not breathed. Mummies were classified if they had one or more of the following characteristics: rubbery skeleton, bloated stomach, lack of hair, brown or black body color, sunken eyes, loose skin or bad odor.

Statistical analysis: Behavior and performance data will be presented descriptively.

Results and Discussion

Behavior measures: On the first day when gilts were placed into the farrowings stall, gilts engaged in almost 80 % of their time budget in an inactive state (which was the summation of sitting and lying). There were no reports of nursing as no gilts on d 0 had piglets. By day 7, a portion of inactive time had been shifted over into nursing related behaviors, and for the remainder of the time in lactation gilts spent about 60 % inactive, 25 % nursing and the remainder active (15 %; Figure 3).

Figure 3. Percentage of the sows behavioral time budget engaged in active, inactive and nursing related postures and behaviors when housed in individual farrowing stalls over four time period; 0, 7, 14 and 21 days.



Performance measures; All gilts farrowed by the ninth day in the farrowing unit. The average number born was 9, born alive 7.55, stillborn, 1.36, number that died before weaning, 0.82 and weaned 6.73 respectively. Therefore in conclusion, gilts behaviorally adapted to the farrowing stall and their performance was not negatively affected, even after being housed in a deep bedded loose housed environment for gestation.

