Reducing temperature requirements for group-housed sows to reduce cost

By Ken Engele, Prairie Swine Centre

Work at Prairie Swine Centre indicates that sows in group housing systems will maintain room temperatures between 9 to10°C, leading to approximately a 78 per cent reduction in energy consumption when compared to pre-set rooms (of 15°C).

Conversion of gestation sow housing from stalls to group systems has been mandated in the recently revised Canadian Code of Practice for the Care and Handling of Pigs, with all sow farms expected to adopt this practice by July 2024 (NFACC, 2014). As such, the pig industry is looking for management options that will take advantage of potential merits of group sow housing, in order to ensure successful implementation group housing systems in all farms.

One such advantage of group housing systems is that sows can better interact with and control their immediate environment, including thermal conditions. According to Dr. Jennifer Brown "sows housed in groups have the freedom to exhibit thermoregulatory behaviour such as huddling to maintain comfort even when the temperature in the barn is lowered." Temperatures currently maintained in barns when sows are housed in stalls are based on the reported lower critical temperature (LCT). Allowing the temperature to drop below this LCT will require additional feed to maintain the sow body condition and weight gain over the gestation period.

It has been estimated that sows housed in groups may have LCT values significantly lower than 15°C when given the ability to utilize behavior such as huddling. If group-housed sows can maintain body condition and weight gain at temperatures lower than currently maintained in sow barns without the need for additional feed, "the potential exists to significantly reduce energy costs for heating and ventilation" notes Dr. Bernardo Predicala.

However, some issues anticipated with group-housed sows include the potential for higher activity levels and aggression among sows. These problems are exacerbated when sows are put on a restricted feeding regime, which is a common practice for gestating sows to maintain optimal body condition. The sensation of feeling "full" is improved with high-fiber diets; these diets are also known to reduce the urge to feed continuously, overall activity and repetitive behaviour in sows.

Dietary fiber increases heat production in sows without increasing digestible energy. As such, adding fiber to the diet can be a means of reducing activity and limiting aggression in sows under reduced barn temperature. According to Dr. Jennifer Brown "Addition of fiber to the diet could be a means of addressing behavioral issues associated with grouped-sows as well as contributing to the energy balance of sows under reduced barn temperature." What temperatures do group-housed sows prefer? This is one of the questions the study set out to answer.

The project consisted of two phases, an environmental chamber followed by a group-housed gestation room. Results from the first phase of the study indicated that throughout the trial a pattern was observed where temperature changes occur mainly during the day when sows are mostly active, as barn operations were carried out (between 7 a.m. - 3 p.m.);

CONTINUED ON PAGE 50

beyond this period, lights in both chambers are turned off. Room temperatures at the time sows activated the operant mechanism was also recorded. Average temperature when the operant mechanism was activated was considerably lower at 10.5°C for the sows fed a high energy, low CP diet. This suggests these could tolerate lower temperatures before calling for supplemental heat compared to sows that were fed a low energy, high CP diet.

In terms of performance, sows fed with low energy, high CP diet seemed to have been more affected by the cold environment, resulting in a negative ADG of -0.5 kg/day on average over the trial period. While sows fed high a high energy, low CP diet in were able to tolerate lower temperatures and performed slightly better with average ADG of 0.2 kg/day.

The second phase of the project configured two barn rooms for group housing, with each room housing 28 gestating sows. One room was operated at a typical set-point temperature (16.5°C) while an operant mechanism was installed in the other room, allowing the sows to control the temperature. Similar to Phase 1, temperature fluctuations occurred mainly during the day (7AM-3PM) when sows are mostly active and when the actual switch presses occurred. Preliminary results for Phase 2 of the project, have shown that sows could tolerate temperature lower than the set-point typically maintained in gestation barns (i.e., 16.5°C) with sows maintaining temperatures about 5°C lower than in a pre-set room, leading to about 78 per cent reduction in energy consumption. At current energy prices, this 78 per cent reduction in energy consumption would improve the producers profitability by more than $5/hog during the heating season. ■