

Housing temperature affects growth performance and carcass quality of pigs

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Pigs can be very sensitive to changes in ambient temperature. When heat stressed, a primary response in the pig is reduced appetite and therefore a reduction in voluntary food intake. Previous work has indicated that changes in food intake, induced by high ambient temperature, influenced growth performance and affected tissue distribution in the carcass (Trezona *et al.* 2002). It was hypothesised that pigs grown in a hot environment will eat less and be leaner at the same slaughter weight than pigs housed within their thermal comfort zone (TCZ). Pigs housed within their TCZ, but fed the same amount as eaten by pigs in a hot environment, will be the leanest because of a higher maintenance requirement to maintain body temperature, therefore less excess energy is available for fat deposition.

Twenty-four female pigs were individually housed at 20 kg LW and fed commercial diets. They were sorted by weight into feeding groups of three and one pig within each group was allocated to a treatment. In the control treatment (CA) pigs were housed within their TCZ for 24 hours a day and allowed *ad libitum* food intake. Pigs in the hot treatment (HA) were housed at 32°C for 20 hours per day and within their TCZ for the remaining 4 hours and were allowed *ad libitum* food intake. CR pigs were housed within their TCZ 24 hours a day, but their intake was restricted to the same amount as that consumed daily by the feeding partner in the HA group. Growth performance was measured on a weekly basis. Pigs were slaughtered at 100 kg LW at a commercial abattoir and carcass quality data was collected.

	CA	HA	CR
Voluntary food intake (kg/day)	2.75 ^a	2.17 ^b	2.18 ^b
Average daily gain (g/day)	802 ^a	758 ^{ab}	724 ^b
Feed conversion (kg feed/kg gain)	3.43 ^a	2.86 ^{ab}	3.05 ^{ab}
Liveweight at slaughter (kg)	102.0	101.8	99.8
Carcass weight (kg)	69.9 ^a	71.5 ^a	66.0 ^b
Dressing percentage (%)	68.6 ^a	70.9 ^b	66.1 ^c
Subcutaneous backfat thickness (mm): P2	14.2 ^a	12.6 ^{ab}	11.3 ^b
shoulder	36.4 ^a	33.9 ^a	29.5 ^b
rump	21.6 ^a	20.5 ^{ab}	15.6 ^b

^{ab} results in the same row with different superscripts are significantly different ($P < 0.05$).

Pigs in the CA group consumed more food and were less efficient than HA pigs. The differences in daily gain, where CA pigs grew faster than CR pigs, were a reflection of the differences between the treatments in food intake and ambient temperature. There were no treatment differences in liveweight at slaughter, however this was not reflected in carcass weight and dressing percentage. Carcasses from the CR group were significantly lighter than those from the other treatments. Carcasses from the HA treatment had the highest dressing percentage and those from the CR treatment had the lowest, differences which may be explained by an effect of food intake and temperature on visceral weight. Carcasses from the CA group had consistently thicker subcutaneous backfat than carcasses from the CR group, and carcasses from the HA group had thicker fat at the shoulder than the CR group. It can be concluded that pigs grown under the same nutrition, but in different environments, will have similar growth paths but differences in carcass quality. It is likely that CR pigs are leaner than HA pigs because of a higher energy requirement for the maintenance of body temperature, and possibly a greater energy expenditure through higher levels of physical activity, therefore leaving less excess energy available for fat deposition.

Reference

1. Trezona M, Nogueira ET, McCullough SM, D'Souza DN, Williams IH, Mullan BP. The effects of hot environments on the growth performance and carcass characteristics of growing pigs. Australian Society of Animal Production 2002; 24: 123.

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