

THE EFFECTS OF HOT ENVIRONMENTS ON THE GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF GROWING PIGS

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Pigs have limited physiological mechanisms to cool themselves therefore the range of temperature within their thermal comfort zone (TCZ) is quite narrow. The voluntary food intake of pigs is very sensitive to ambient temperature. Pigs exposed to temperatures above their TCZ exhibit either a reduction in total food intake, or a change to their meal patterns, such as eating larger meals during the cool periods of the day. Giles and Black (1991) reported that pigs were able to consume sufficient food if they spend adequate time within their TCZ to compensate for the reduction in intake during the time spent when temperatures were high. It is hypothesised that changes to meal patterns can impact energy and protein metabolism and hence affect the growth performance and carcass characteristics of the pig.

Sixteen female pigs were individually housed at 20 kg liveweight (LW) and were allocated to temperature treatments. Pigs in the cool environment treatment (CC) were housed within their TCZ at 24°C, for 24 hours a day until slaughter at 100 kg LW. The temperature was reduced to 18°C when pigs reached 60 kg LW. Pigs in the hot environment treatment (HH) were housed at 32°C for 20 hours and for the remaining four hours the temperature was reduced to the same level as in the cool environment. In the cool and hot environment treatment (CH), pigs were housed within their TCZ at 24°C until 60 kg LW and then at 32°C (including the daily four hour cool period) until slaughter. The hot and cool environment treatment (HC) was the reverse of the CH treatment. All pigs were allowed *ad libitum* access to feed and water. Drik-o-mat® drinkers were installed into each pen to reduce the pigs' ability to cool themselves by wetting their skin. Weekly liveweight and food intake was measured. Pigs were slaughtered at a commercial abattoir and the hot carcass weights and backfat depth at the P2 site were collected. Statistical analysis was conducted by analysis of variance.

Table 1. The effect of ambient temperature on growth performance and carcass characteristics of pigs

Treatment	ADG (g/day)		FCR (kg feed / kg LW gain)		Carcass wt (kg)	P2 (mm)
	20 - 60 kgLW	60 - 100 kgLW	20 - 60 kgLW	60 - 100 kgLW		
CC	860 ^a	809	2.13	3.77 ^a	69.6	13.5 ^{ab}
CH	816 ^{ab}	784	2.21	3.16 ^b	73.0	10.8 ^a
HH	779 ^{bc}	771	2.17	3.19 ^b	72.7	13.8 ^{ab}
HC	737 ^c	882	2.33	3.41 ^a	69.8	14.9 ^b

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

Pigs in the hot environments had lower ADG compared to the pigs in the cool environments between 20 and 60 kg LW. Growth from 60-100 kg LW was not significantly affected by ambient temperature however pigs in the HC treatment, now in the cool environment, grew about 100g/day faster than pigs in the other treatments. From 60 kg LW until slaughter, pigs in the hot environment had a lower FCR compared to pigs in the cool environment. Carcasses from the CH treatment had a lower P2 and this may be due to the change from the cool to the hot environment. The high temperatures indirectly reduce food intake at a time when the proportion of fat:lean gain is increased. The results from this experiment clearly indicate that ambient temperature can influence growth performance of pigs and this may affect carcass quality.

GILES, L.R. and BLACK, J.L. (1999). In 'Manipulating Pig Production III' pp. 162-166.

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