

EFFECT OF AMBIENT TEMPERATURE ON VOLUNTARY FOOD INTAKE, BODY TEMPERATURE AND MILK YIELD IN A LACTATING SOW

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Survey results of ambient temperature in commercial farrowing sheds in Victoria averaged 26°C (range 17 to 39°C) during February. Temperatures at sow level were frequently above 22°C which Mullan (1991) predicted to coincide with the lactating sow's evaporative critical temperature (ECT). Previous studies with growing pigs (90 kg live weight) have shown that voluntary food intake (VFI) declined after ECT, a temperature at which evaporative heat loss begins to increase through increased respiration rate (RR), in association with a rise in body temperature (BT) above 39.5°C (Giles and Black 1991). The objective of this experiment was to investigate the influence of ambient temperature on VFI, RR, BT and milk yield of a lactating sow to confirm the previously published values for ECT.

One primiparous hybrid sow (mean live weight 148 kg) was fed ad libitum a diet containing 14.3 MJ digestible energy/kg and 0.7% total lysine. The sow was housed at 18°C (air speed <0.1 m/sec; relative humidity <50%) in a commercial farrowing crate and prevented from wetting the skin. Litter size was seven piglets and 12 days after farrowing the sow was exposed sequentially to 18°, 28°, 18° and 25°C, each for four days except for the second 18°C treatment which was for six days. Ambient temperature, RR, BT and VFI were measured at intervals of 1 h for the duration of the study. Milk intake of each piglet was calculated for each temperature period by isotope dilution using tritiated-water (Dove and Freer 1979). The daily results (mean ± SEM) for ambient temperature, RR, BT, VFI and milk intake are presented below. The sow lost 18 kg live weight during the 29 day lactation period.

Temperature (°C)	Days post-partum	RR (/min)	BT (°C)	VFI (kg/day)	Milk intake (kg/piglet/day)
17.8±0.03	12-15	16.3±0.5	39.2±0.1	2.7±0.6	0.99±0.12
28.0±0.01	15-19	46.8±2.0	40.4±0.0	2.1±0.2	0.72±0.11
17.1±0.04	19-25	19.1±1.4	39.3±0.1	3.1±0.4	0.98±0.24
24.9±0.22	25-29	22.8±0.9	39.7±0.1	2.7±0.4	1.03±0.13

During the four days at 28°C, VFI and milk intake declined by 22 and 30% respectively in association with a sharp rise in RR and BT. In contrast at 25°C, VFI declined by 45% on day one but recovered to normal levels for the remainder of the period without affecting milk intake of the piglets. Similarly RR and BT increased at 25°C to 30 breaths/min and 40.3°C respectively on day one but recovered to normal by day two. These results suggest that ECT of the lactating sow is close to 25°C.

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