

THE BEHAVIOUR AND HEART RATE OF CATTLE AT DIFFERENT LOADING DENSITIES DURING ROAD TRANSPORT

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A survey of trucks delivering cattle to saleyards and abattoirs (Eldridge and Hollier 1982) indicated that there was considerable variation in the density of loading during road transport. There are no published reports on the effect of loading density on animal behaviour and welfare during the road transport of stock in Australia.

Fifty four Angus x Shorthorn heifers with a mean live weight of 359 ± 0.4 kg were divided into six groups of similar live weight for an experiment to study the effect of loading density and road type on the heart rate and behaviour of cattle during road transport. The loading densities (1.13 and 0.93 animals/m²) were 10 per cent higher and lower respectively than that recommended by Grandin (pers. comm.) and were achieved by varying pen size. Three road types were incorporated into a single trip (approximately 135 km) and simulated country roads (A), highways (B) and suburban roads (C); each road type covered 19.4, 35.9 and 15.5 km respectively, took 20 to 25 min travel time and was preceded by approximately 10 min travel on a "standard" road surface. Road type and sequence of travel were incorporated into two 3 x 3 latin squares over six trips. A group of cattle was carried at each loading density on each of the first three trips. On the subsequent three trips, the groups of animals were carried at the alternate density to that of their first trip. The heart rate of four animals in each pen was continuously monitored by radio biotelemetry equipment (Wyoming Biotelemetry, Inc.) while behaviour was recorded on closed circuit television (CCTV).

TABLE 1 Effect of loading density (1.13 and 0.93 animals/m²) and road types (A) country, (B) highway and (C) suburban roads on the heart rate (beats/min) of cattle

Loading Density	Road type			Mean
	A	B	C	
1.13	71.2 ^a	68.6 ^a	68.6 ^a	69.4 ^x
0.93	76.0 ^c	71.7 ^{ab}	75.7 ^{bc}	74.5 ^y

a,b,c = significantly different $P < 0.05$, x, y = significantly different $P < 0.01$

The highly significant difference ($P < 0.01$) in heart rate between loading density (Table 1) was due to the interaction between loading density and road types A and C ($P < 0.05$), smooth highway travel had no effect on the heart rate of cattle. The behaviour of animals recorded on CCTV, assessed by the number of movements greater than one metre during transport, indicated that animals loaded at the lower density moved more than at the higher density (11.2 ± 1.2 and 3.8 ± 0.4 movements respectively; $P < 0.05$). There appeared to be no effect of road type on the number of movements.

Lower heart rates and less movement of cattle during transport could be expected to be reflected in less stress and bruising. The results of this experiment indicate that loading density could be an important factor in reducing the level of stress and bruising particularly on the rougher country roads and the stop-start driving encountered on suburban roads.

ELDRIDGE, G.A. and HOLLIER, T.J. (1982). Proc. Aust. Soc. Anim. Proc. 14: 301.

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