EFFECT OF TIME BETWEEN MUSTERING AND SALE ON LOSSES IN LIVE AND CARCASS WEIGHT OF BULLOCKS

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SUMMARY

The effect of time between mustering and sale on weight loss was studied using Brahman crossbred bullocks of mean initial liveweight 532 kg. Five groups were transported up to 450 km to an abattoir and slaughtered at various times between 3 and 11 days after mustering, while a sixth group went 1,880 km to another abattoir and was slaughtered 11 days after mustering. Groups had access to water alone for 18 h before final weighing and then fasted for 16 h before slaughter. Final liveweight decreased at the rate of 2.50 kg/d ($P < 0.05$) and carcass weight at 0.95 kg/d ($P < 0.05$). It was ccncluded that time since mustering affected loss of carcass weight more than distance travelled. Transportation per se had some effect on liveweight, but none on carcass weight.

INTRODUCTION

Many days can elapse between the mustering and sale of cattle in northern Australia. While travelling time depends on the total distance, it can be extended by the need to rest cattle during long journeys and on arrival, as well as by other delays before sale. In an attempt to maximise profits, producers do not always send cattle to the nearest saleyard or abattoir, thereby increasing the total journey. Time appears to affect weight loss more than distance travelled, while transportation per se has little additional effect, provided cattle are watered before slaughter (van den Heever *et al.* 1967; Wythes *et al,* 1981).

Since most northern cattle are sold by the weight and grade method direct to an abattoir, losses in carcass weight are economically more serious than those in liveweight. However, the latter have become more important with the recent proliferation of liveweight selling centres. There is limited information for Australian conditions on the effects of time between mustering and sale on live and carcass weight (Wythes et *al.* 1981). We examined these effects using Brahman crossbred bullocks transported up to 450 km and 1,880 km from 'Spring Creek', Mt Surprise, to two abattoirs in Queensland in July 1980. Treatments represented various periods from mustering to sale for marketing cattle in northern Australia.

MATERIALS AND METHODS

The 102 Brahman crossbred (approximately 50–75% Brahman content) bullocks were 4-6 years old, with a mean initial liveweight of 531.9 ± 4.8 kg (± SE). They had been grazing native pastures.

After yarding at midday the experimental bullocks were weighed between 1400 and 1800 h. Next morning they were drafted into six groups, after allocation on liveweight. All groups had access to water between weighing and transportation. The first group was transported immediately 330 km by road to an abattoir. On day 3, four groups were transported 450 km by road and rail to the same abattoir, while the sixth group went 1,880 km to a different abattoir and rested twice *en route.* Full details of the final treatment schedules are given in Fig. 1. The original slaughter days for groups 3 and 4 were delayed by an industrial dispute, with group 3 being fed hay and group 4 undergoing an extra travel period. Groups 4 and 5 were subjected to simulated transport regimes from arrival at the first

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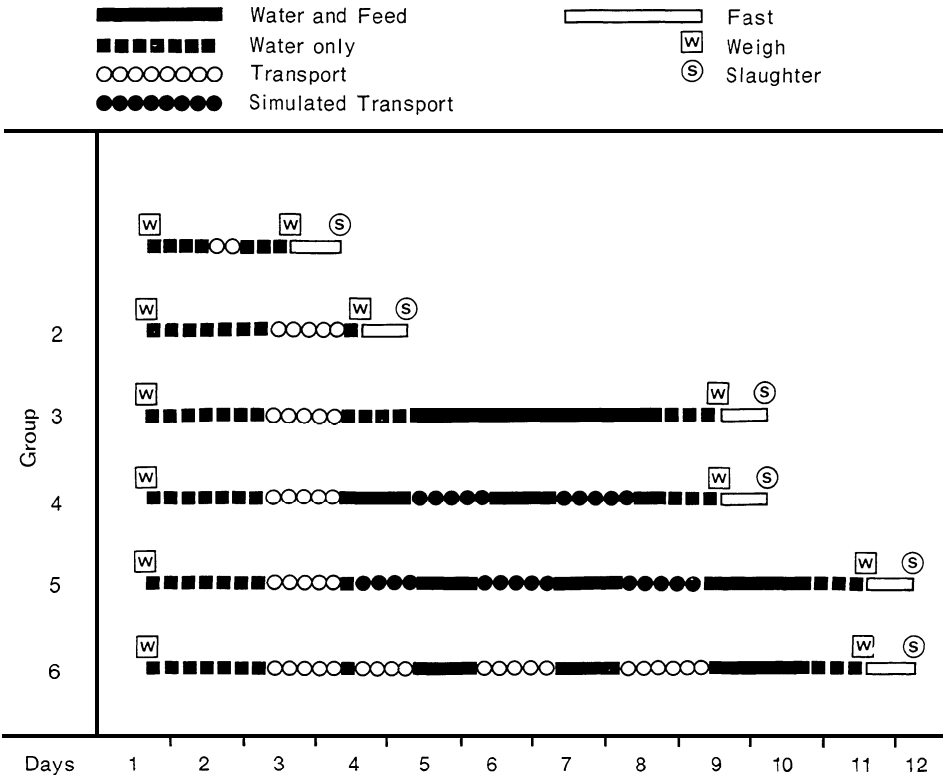

Fig. 1. Diagrammatic representation of the schedule for each treatment group

TABLE 1 Effect of time between mustering and sale on live and carcass weights of Brahman crossbred bullocks

Group	Days from muster to slaughter	Distance travelled (km)	Final liveweight (kg)	Net liveweight loss (%)	Gross hot carcass weight (kg)	Liver weight (kg)
1	3	330	$501^{a\dagger}$	5.8^{a}	290^{a}	4.7^{a}
2‡	4	450	502^{a}	5.6^{a}	290^{a}	4.6^{a}
3	9	450	489^{b}	8.2^{b}	290^{a}	4.2^{b}
4	9	450	479^{b}	9.9^{b}	282^{a}	3.8^{b}
5	11	450	488^{b}	8.4^{b}	285^{a}	4.1^{b}
6	11	1880	478^{b}	10.1^{b}	285^{a}	4.1^{b}
SE of difference			5.9	1.00	3.5	0.17

† Means with same superscript do not differ significantly at $P < 0.05$.
‡ Fed hay for 4.5 d, as slaughter was delayed by an industrial dispute.

abattoir, with the schedule for group 5 matching that for group *6.* During 'travel' these bullocks were confined to a small yard without feed and water, but during 'rest' periods they were able to exercise freely in a large yard, with hay and water available. For all groups the feeding rate was *c.* 3 kg hay/hd/d.

For the last 18 h of the final rest period, all groups (except 2) had access to water alone before weighing at 1500 h. This simulated a saleyard where water was available during curfew and sale periods. All groups then fasted for a standard 16 h before slaughter. Total times from mustering to sale for **groups** 1 to 6 were 3, 4, 9, 9, 11 and 11 d.

Procedures at slaughter were the same for all groups. The trim was bulk-weighed for each treatment group and the average added to hot-trimmed weights for estimation of individual gross hot carcass weights. Liver weights were recorded. Dressing percentages were calculated using gross hot carcass weights and both initial and final liveweights.

The data were analysed by analysis of variance procedures, using initial liveweight as a covariate. For treatment groups 1, *2, 4* and *5,* the *3* degrees of freedom were partitioned into linear, quadratic and cubic components using the carrier variables of 3, 4, 9 and 11 d.

RESULTS

Bullocks in groups 1 and 2 had heavier ($P < 0.05$) final liveweights and therefore lower ($P < 0.05$) net (initial-final) losses in liveweight than those in other groups (Table 1). Groups 1 and 2 also had the heaviest ($P < 0.05$) livers. Differences in carcass weight between groups failed to reach significance. Dressing percentages did not vary between groups, with means of 54.0 ± 0.19% (± SE) when calculated using initial liveweight and 58.7 ± 0.26% using final liveweight,

The linear components were significant ($P < 0.05$) for the regressions of final liveweight and carcass weight on time whereas the quadratic component was significant ($P < 0.01$) for liver weight. The equations were (Y = weight and x = time, i.e. days since mustering):

Final liveweight $Y = 492.95 - 2.50\ (\pm\ 0.704)X$
Carcass weight $Y = 286.85 - 0.95\ (\pm\ 0.390)X$
Liver weight $Y = 4.30 - 0.10\ (\pm\ 0.106)X + 3.97\ (\pm\ 0.117)X^2$

DISCUSSION

Our study indicates that considerable losses in carcass weight can occur during the marketing of cattle in northern Australia. Time from mustering to sale was more important than distance travelled, since bullocks slaughtered 11 d after mustering had a mean carcass weight of 285 kg, whether sent 450 or 1,880 km. Transportation per se had no effect. These results confirm previous reports (van den Heever *et al.* 1967; Wythes *et al,* 1981). The decline in carcass weight of about 1.0 kg/d agrees with that recorded by Wythes et *al,* (1981) for cows over the same post-mustering period. The time intervals in this study are typical of those for marketing cattle in northern Australia, with few animals being slaughtered within *3* d of mustering. While carcass losses are probably small during the first few days (Kirton *et al.* 1972), our results may underestimate losses as the first group was not slaughtered until day 4.

Although the greatest loss in liveweight was during the first 2 d, time since mustering still had some effect on final liveweight. The rate of loss was

about 2.5 kg/d and liveweights within 3 d of mustering were heavier than those after 8 d or more. These trends are in accord with other findings (Truscott and Gilbert 1978; Wythes et *al.* 1981). Transportation per se appeared to reduce liveweight by causing an additional loss in gut fill, since bullocks held at the abattoir after 450 km were 10 kg heavier than those transported 1,880 km.

Our findings have important implications for producers. When selling cattle on carcass weight, they need primarily to consider time rather than distance, despite the confounding of these two factors. Whilst this also is true when selling cattle on liveweight at saleyards, distance has some influence because of the additional effects of transportation. Nevertheless under certaincircumstances, it may be worthwhile for producers to extend deliberately the time from mustering to sale by 24 h, for example, if this action increases the choice of markets or permits the use of cheaper, though slower rail transport.

Feeding hay during the industrial dispute affected liveweight more than carcass weight. The effect on carcass weight was difficult to determine due to the inexplicably light carcasses of group 4 and possibly heavy carcasses of group 3. Our results suggest that feeding was worthwhile, but further research is warranted.

Our study shows that losses in carcass weight increase with time since mustering, whereas the greatest loss in liveweight occurs within the first few days. Our results and those of Wythes *et al.* (1981) provide some evidence for producers to estimate costs and returns, when determining where to sell their cattle. Nevertheless there is a need to examine ways to alleviate or at least to minimize carcass losses.

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