

Correcting Cattle Liveweights in the Tropics for Weighing Protocol

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Cattle liveweights may not be comparable if measurement protocol varies. In three north-Australian studies, cattle feeding and drinking up to commencement of a full fast experienced linear liveweight loss of 6-8% after 24 hours (Robbins *et al.* 1982; Tyler *et al.* 1987; Wythes *et al.* 1980). Robbins *et al.* (1982) also trucked the cattle during the fast. We sought methods to compare grazing cattle liveweights measured using a range of protocols.

Non-pregnant female cattle at two sites (Brahmans at Swan's Lagoon, SW of Townsville; 2 groups of mixed Brahman and tropical composite cattle at Belmont, north of Rockhampton) were mustered at sunrise from their paddock and weighed: P protocol. Within group, animals were allocated to 3 protocols for re-weighing:

F: Into a small paddock with water till the next morning when mustered and weighed again (full liveweight).

W: Return to feed and water; re-yarded overnight with water but without feed from 16:30 hours (wet curfew).

D: Return to feed and water; re-yarded overnight without water and feed from 16:30 hours (dry curfew).

The overnight fast was for approximately 14 and 16 hours at Swan's Lagoon and Belmont, respectively. The Swan's Lagoon observation was under late dry season conditions. The Belmont observation was in a week following season-breaking rainfall. Average se within group of ratios of F/P, W/P and D/P liveweights was 0.17%. Each weighing protocol was compared to the F protocol ($W/F = W/P \times P/F$; $D/F = D/P \times P/F$) which best replicates industry practice where cattle have drunk and been feeding a short time prior to weighing.

Table 1. Effect of weighing protocol on liveweight when compared to full liveweight

Group	n	Average weights					P Wt/F Wt	W Wt/F Wt per hour	D Wt/F Wt per hour
		P	sd	F	W	D			
Swan's Lagoon cows	112	469	43	476	458	457	-1.40%	-0.25%	-0.30%
Belmont cows	59	546	56	553	541	541	-1.50%	-0.17%	-0.14%
Belmont heifers (13 m)	66	277	24	284	270	276	-1.90%	-0.21%	-0.18%

Cattle on P protocol weighed 1.4-1.9% less as most do not move to waters until after sunrise. The dry curfew liveweight loss of Swan's Lagoon cows equates to 7.2% loss in 24 hours, consistent with previous reports. As 15-25% of nutrient intake is dry matter, expected wet curfew liveweight loss was ~20% of dry curfew loss. The wet curfew liveweight loss of Swan's Lagoon cows was 4-5 times expectations. This may be due to failure to drink yard water by a majority of cattle because their usual experience is a dry overnight curfew and lower water palatability in infrequently-used troughs. Dry curfew liveweight loss was 30-50% higher at Swan's Lagoon than at Belmont where there was relatively-benign weather compared to the typical hot and dry pre-wet seasonal situation. Truscott and Gilbert (1978) reported 0.18% liveweight loss/hour in full-fasted British steers in the temperate climate of Victoria. The lack of difference between wet and dry curfew groups at Belmont could have been due to a combination of not usually being yarded overnight, water palatability in infrequently-used troughs, the relatively-benign weather and probably-lower gut fill due to cattle grazing short green feed.

To enable direct fairer comparisons of cattle liveweights in the tropics we recommend upward adjustment by:

- Nil if weighed directly after drinking and grazing.
- At least 1.5% if mustered and weighed in the morning prior to drinking. As daily water intake can be near 10% of liveweight, the adjustment may approach this level under hot dry conditions where cattle are known to have not drunk for 24 hours.
- 0.3% per hour fasted if on a dry curfew. Adjustment should be reduced by up to 50% during benign weather.
- 0.06% per hour if fasted on a wet curfew, except where water intake is observed to be low when the adjustment should be increased to as much as 0.25% per hour.

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