Water intake behaviour of mixed age ewes in Summer and Autumn in the Manawatu region of New Zealand

R. A. Corner-Thomas[A,B], *L. L. Burkitt*[A], *I. G.* Draganova[A] *and P. R. Kenyon*[A]

[A]School of Agriculture and Environment, Massey University, Palmerston North, New Zealand.
[B]Email: r.corner@massey.ac.nz

In New Zealand, sheep are managed under pastoral farming systems in fenced paddocks. In large scale hill country environments, the primary source of drinking water is often from natural waterways. It is likely that sheep may be prevented from accessing natural waterways in the future due to climate change and potential environmental concerns with the aim of improving New Zealand's natural water quality. If the natural sources are fenced off, permanent reticulated water supply systems would be required, although costs may be prohibitive. Therefore, knowledge of the water intake behaviour of sheep under New Zealand's environmental conditions is necessary to determine the potential impacts of fencing water ways and to develop management plans.

Drinking behaviour of mixed aged ewes was recorded in both summer (2017, n=37) and autumn (2018, n=20) for 30 days. Data was collected using 24-hour motion activated video infrared cameras. In addition, ewes were fitted with triaxial accelometers to determine proximity to the water toughs. Proximity within 3m of the trough was determined from the received signal strength indicator (RSSI) using the equation of Sohi *et al.* (2017) to estimate distance. Ewe live weight data was recorded at the beginning and end of each study. Pasture water content was measured weekly and daily weather data was collected. The study was located on Keeble farm 5km south of Palmerston North (40° 23' 44.376" S 175° 36' 7.0848" E).

The weather conditions of both years are shown in Figure 1. During the 2017 study the pasture moisture content ranged between 73 and 85% and in 2018 between 76 and 79%. The frequency of visits to the trough was highly variable between individuals in both years. In 2017, three ewes were observed to drink from the trough only once each and four ewes twice during the entire study period (n=7). In 2018, nine ewes were not observed to drink throughout the study, six ewes visited once or twice, and three ewes visited between three and six times. Across both studies all drinking events were observed between 9:30am and 6pm. Similarly, the proximity data collected by the accelerometers showed that duration a ewe spent within 3m of the trough was highly variable. In 2017, during a 16-day observation period, 24 ewes spent less than an hour near the trough, 8 spent between 1 and 4 hours and 2 more than 4 hours. In 2018, during a 12-day period, 8 ewes spent less than one hour near the trough, 6 between 1 and 4 hours and 6 more than 4 hours.

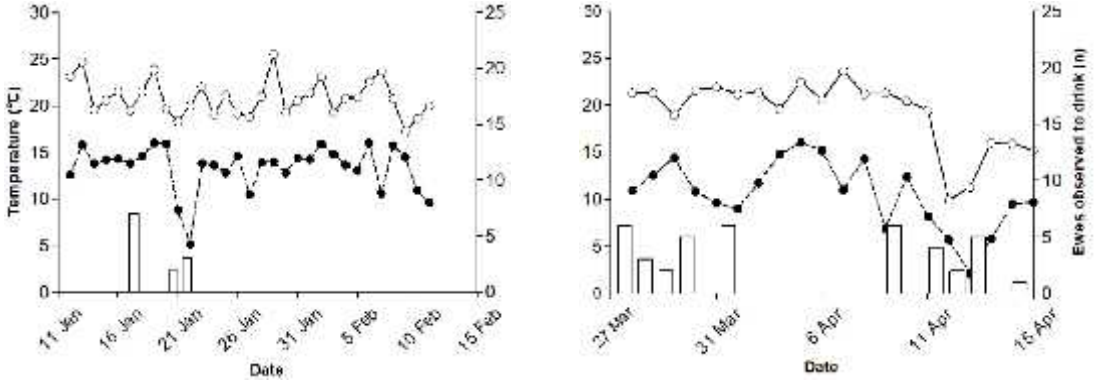

Figure 1. Minimum (closed dots) and maximum temperatures (open dot, ˚C) and the number of ewes observed to drink during each study period (bars).

The results of this study suggest that due to the low drinking frequency observed in the current study, sheep could be provided with only small toughs, as there appears to be little competition at any one time point, although numbers were small. These findings are in agreement with calculations which suggest that a 60kg ewe fed to meet maintenance requirements in mid-pregnancy grazing pasture with ME of 11 MJ/kgDM and moisture content of 85% would ingest 5.95L/day of water which is sufficient to meet requirements (CSIRO 2007). Further work is required to examine the physiological effects across different environments.

References

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