



Tropentag, October 7-9, 2008, Hohenheim

“Competition for Resources in a Changing World:
New Drive for Rural Development”

Drinking Behaviour and Water Intake of Boer Goats and German Blackhead Mutton Sheep

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Abstract

The aim of this investigation was to study differences in average daily water intakes between small ruminant species differing in their adaptation to climatic conditions. Boer goats were chosen as arid adapted species and compared to German Black Head mutton originating from temperate climates. Sixteen non-lactating female animals (8 Boer goats, BW of 64.7 ± 3.7 kg and 8 German Black Head mutton ewes, BW: 67.5 ± 8.8 kg; mean \pm SD) were kept under controlled stable conditions (room temperature: $13.6 \pm 0.4^\circ\text{C}$; light schedule: 10 h dark : 14 h light). Animals had access to hay and water ad libitum. Diurnal drinking behaviour was recorded by video. Individual water intake was estimated from water kinetics using the deuterium dilution technique during 2 wks. Simultaneously, water intake was directly measured by weighing water buckets every 24 h. Additionally, individual hay intake was measured daily.

The average daily water intakes (l) differed significantly ($p = 0.01$) between the two species, with higher intakes in sheep (4.68 ± 1.54 l) than in goats (2.34 ± 0.86 l); these significant differences were maintained when relating water intake to metabolic body weight resulting in 195 ± 60 (sheep) vs. 104 ± 39 (goat) $\text{g kg}^{0.75}$ BW. Daily hay intake differed significantly between sheep and goats, whether expressed as kg per day (1.64 ± 0.50 vs. 1.29 ± 0.50 kg DM; $p = 0.011$) or as g per metabolic weight (68 ± 20 vs. 57 ± 23 $\text{g kg}^{-0.75}$ BW; $p = 0.040$). The higher amount of water intake in sheep was also reflected by the drinking behaviour: sheep spent approximately 2% of 24 h (31 ± 19 min per day) drinking while Boer goats spent only 0.7% (10 ± 9 min per day). It is suggested that the lower water intake in Boer goats seems to be an adaptive mechanism to arid climates.

Keywords: Deuterium, goats, sheep, water intake, water turnover