LINCOLN UNIVERSITY
TE WHARE WĀNAKA O AORAKI

Thirsty Stock

Notes and student worksheet

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Variability of Water Consumption

Water requirements for stock vary due to the species of animal, its purpose, lactation, size, type of feed, and environmental conditions such as temperature, wind and humidity.

Effect of temperature on cows: We all have an ideal temperature range, where we feel comfortable and our immune system and organs function properly. The comfortable temperature range for a cow is 4-20°C, lower than for a human. Friesian and crossbreed herds start to reduce production of milk when temperature is greater than about 21°C. Jerseys are more tolerant of heat, with production losses insignificant until 25°C. One-way cows get rid of excess heat is through the evaporation of their breath and sweat. To increase evaporation, they breath faster and sweat more, although their ability to sweat is limited. When this isn't enough, they eat less to reduce the production of heat in their rumen, so their milk yield declines. (Dairy NZ Heat Stress, 2023).

In winter hay can be feed out to livestock which helps keep them warm. This is through the fermentation (digestion) of forage in the animal's rumen which naturally produces heat, which contributes to internal warming and helps maintain core body temperature. Research in 2022 also showed that cows managed on pasture with hay had higher skin temperatures, cleaner coats, greater rumination time and lying in postures of comfort, when compared to cows feed on kale crops. "The diet of pasture and hay promotes rumination throughout the day and night which helps with thermoregulation when the weather is cold. The hay litter left from the hay bales gives the cows an insulated and soft surface to lie down and rest on, which we know cows prefer." (AgResearch senior scientist Karin Schütz, 2022).

Effect of temperature on sheep: Since sheep are considered very resilient animals, their ability to cope with hot environmental conditions, without harming their welfare and productive performance, has often been overrated. Sheep environmental temperature range (thermoneutral zone) where they feel most comfortable and no extra energy is spent to maintain body temperature (shivering or panting) is approximately between 5 and 25°C. This is affected by age, breed, wool length and type for example the lower critical temperature of a mature sheep in full fleece can be as low as -20°C. Research has shown shade reduces body temperature in sheep in New Zealand at air temperatures >20°C. With climate change strategies and farm management systems need to be further developed and studied.

Quantity of Water

There have been a few studies that have looked at measuring the water requirements for different stock as there are provisions under the law that allow for stock water to be taken without a consent. Due to the demand for water and the decreasing quality of our water supplies, water use has become a focus of many Regional Councils who manage it through resource consents.

In terms of quantity of water consumed the following numbers have been sourced from the Horizons Regional Council (HRC) Guidelines (2007) for Resource Consent Applications. The council looked across many research papers to come up with their guidelines. If you just want a simple range, then use the table. If you want numbers for goats, chickens and pigs then refer to the HRC Guidelines document.

Stock Water Consumption/ Quantity

Beef Animal Description (water take measured in litres/head/day)	**Average Daily Demand (l/h/d)**	**Peak Daily Demand (l/h/d)**
Breeding cows (450kg) with suckling calves & calf drinking water	28	57
Heifers, steers & bulls (600kg)	27	54
Weaners (135-270kg)	16	32
Dairy Animal Description (water take measured in litres/head/day)	**Average Daily Demand (l/h/d)**	**Peak Daily Demand (l/h/d)**
Milking Cows (450kg)	36	72 (Dairy NZ says 100+ l/h/d)
Dry Cows	30	40
Calves	20	30
Sheep Animal Description (water take measured in litres/head/day)	**Average Daily Demand (l/h/d)**	**Peak Daily Demand (l/h/d)**
Breeding Ewes	3	4.5
Ewe (55 kg) lamb is weaned	2	4
Ewe (65 kg) lamb is weaned	2.5	5
Hogget (30kg pre-winter, slow growth rate)	1.4	2.8
Hogget (50kg pre-winter, fast growth rate)	2.4	4.8
Ram (75kgs pre-winter)	1.6	3.2
Deer Animal Description (water take measured in litres/head/day)	**Average Daily Demand (l/h/d)**	**Peak Daily Demand (l/h/d)**
Mature Hind (100kg)	5.7	11
Hind 15-27 months (~90kg)	5.4	11
Mature Stag (185kg)	6.6	13
Stag 15-27 months (125kg)	6.3	13

Thirsty Stock Basic Notes

Beef

Average range = 30 - 55 l/h/d

The low end of the range would cover stock drinking under normal conditions, while the high end provides for cows when suckling calves, and for drinking water for calves (when they are still with the cow) during the few months before they are sold off. After this, the breeding herd would be dried off and consuming less water. **(Horizons Regional Council (HRC), 2007)**

Dairy

Average range lactating = 45 - 70 l/h/d drinking water + 50 – 70 l/h/d dairy shed water

Average range dry = 30 – 40 l/h/d

Lactating cows will typically require more than **100 litres/cow/day** and will drink between two to six times per day. Ensure flow rates to troughs are high enough that the trough never runs low. Most cows drink soon after milking, so install water troughs in races to meet that need. Cows should not have to walk more than 250m to get a drink. Providing larger troughs or more than one trough will reduce the impact of 'guarding' by dominant cows. Cows will drink more water if it is clean and palatable. (**Dairy NZ Heat Stress, 2023)**

Sheep

Average range = 2 - 4 l/h/d

When on dry pasture drinking requirements can double to 8 l/h/d from around 4 l/h/d green pasture. If the ewes are nursing and on dry pasture, then it can get up to 9l/h/d. These numbers are different from those in the table as it was a different study and there are different variables affecting the results. **(HRC, 2007)**

Deer

Average range = 6 – 12 l/h/d

For temperatures over 20°C, approximately 1.0 l/day should be added per 100 kg liveweight for every 5°C increase in temperature. For lactating hinds an additional water requirement of 1 l/kg milk produced has been added. **(HRC, 2007).** In one study of well-fed red deer hinds, the peak yields of 1.4 to 2L of milk was produced per day in early lactation. "Total yields for the first 150 days were estimated to be 140 to 180 kg in well-fed hinds and 65 kg in the underfed hind", (Pamela Arman et al., 1974).