

1st April 2026

Dear Sir/Madam,

Re: Water requirements of dairy cows and the impact of water restriction

I have been asked to write a summary regarding the requirement for water and the impact of restriction of water intake in dairy cows for my client, Guy Dutton.

As milk is approximately 87% water, water intake is the most critical quantitative nutrient requirement for a dairy cow. Dairy cows require between 60 and 120 litres of water per day on average, but this is dependent on milk yield and ambient temperature

There is a direct positive correlation between milk production and water intake.

- **Production Ratio:** On average, a cow needs to drink at least 3 to 4 litres of water for every 1 litre of milk produced.

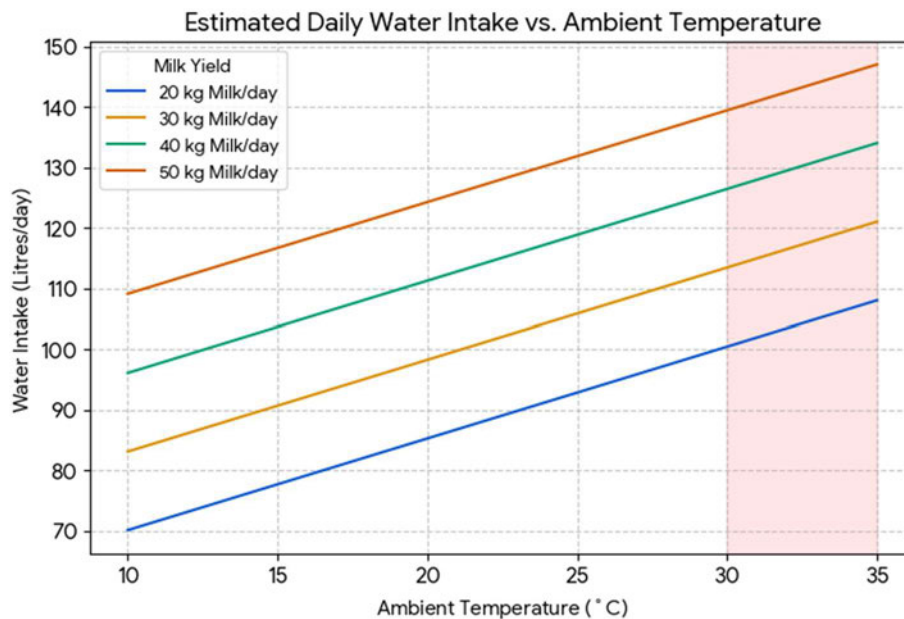
In addition, cow behaviour impacts on the timing of maximum water intake. Cows do not spread their water intake evenly throughout the day so there are periods of peak demand.

- **Peak Consumption:** Roughly 30% to 60% of a cow's daily water intake occurs shortly after milking.

As temperatures rise, water is increasingly needed for cooling through respiration and sweating.

- **Incremental Increase:** For every 1°C rise in ambient temperature, a cow's water consumption increases by approximately 1.2 to 1.5 litres per day.
- **Heat Stress Threshold:** Water needs increase markedly at temperatures above 30°C. During periods of heat stress, total water intake can double compared to thermoneutral conditions.

- **Extreme Heat:** On a very hot day, a high-performing cow may consume up to 250 litres of water to maintain her body temperature.



The graph above illustrates how the combination of higher milk production and rising temperatures compounds a cow's total water requirement, particularly as she enters the "Heat Stress Zone" above.

So, what would be the impact of water restriction in a dairy cow?

Restricting water intake in dairy cows has immediate and severe consequences. Even moderate restriction can lead to significant drops in productivity and animal welfare.

1. Rapid Decline in Milk Yield and Feed Intake

- **Milk Production:** Restricting water to 50% of a cow's normal intake can cause milk yield to drop by as much as 74% within 4 days.
- **Feed Intake:** The first sign of insufficient water is a sharp decrease in feed consumption. Cows may reduce their feed intake by 50% starting with the very first meal after severe water restriction.
- **Digestive Disruption:** Water is essential for normal rumen function. Without it, microbial activity in the rumen declines, slowing down the digestion of nutrients.

2. Physical and Physiological Changes

- **Dehydration Signs:** Visible symptoms include constipation (firm, dry manure), sunken eyes, and a loss of skin elasticity.
- **Body Temperature:** Restricted cows may experience a slight increase in rectal temperature, as they have less water available for cooling through sweating and respiration.

3. Behavioural and Welfare Impacts

- **Aggression:** Cows often become aggressive around water troughs when access is restricted, with dominant cows potentially preventing subordinate ones from drinking.
- **Discomfort:** Restricted cows spend less time lying down and may exhibit signs of acute stress, such as licking empty water bowls for long periods.

4. Severe Risk: Salt Toxicosis (Water Deprivation Syndrome)

In cases of extreme deprivation (longer than 24 hours), sodium levels can accumulate dangerously in the brain.

- **Symptoms:** This can lead to blindness, circling, seizures, and partial paralysis.
- **Rehydration Danger:** If a severely dehydrated cow is suddenly given unlimited water, the rapid shift can cause brain swelling (cerebral oedema), which is often fatal. Rehydration must be done slowly over 12–24 hours.

It is very important that dairy cows (and all farmed livestock for that matter given it is a legal requirement) are provided free access to water throughout the day.

Yours Faithfully,



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