

Smart Water Use in the Farm Dairy

This guide looks at water use in and around the farm dairy, and whether there's potential for greater efficiency. Use it to evaluate your options for improvement.



Efficient use of water can help:

- control power use and costs
- manage effluent in a cost-effective manner
- get the most out of staff time
- reduce water costs if you pay for it by volume
- meet regulatory obligations that may apply in your region.



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Milk cooling

Use source water from Tank 1.

Aim for the recommended ratio of 2½ water: 1 milk

For example,

$$2.5 \text{ litres (water)} \times \text{peak daily litres (milk)} \div 1,000 = \text{m}^3/\text{day water use}$$

To measure milk cooling efficiency

Measure exit flow into a 200 litre drum during milking.
Flow rate in litres/min x total daily milking time (clock this) ÷ 1,000 = m³/day water use



Alternatively, install a meter on the line delivering water to the plate cooler

Efficiency options

Things to consider if improved cooling efficiency is warranted:

- use of correct flow rates
- optimal plate spacing to increase flow
- pre-cool water source
- ice banks/heat exchangers (can be costly).



Return milk cooling water to Tank 2 for use in yard wash down.

Ensure adequate storage space remains to take all milk cooling water (use float ball or probes).

Capture roof water for reuse or at least exclude it from the yard to prevent increasing effluent volumes.

Yard wash down

To measure yard wash down water use

Follow the steps and calculations in the accompanying *Worksheet* to estimate water use.



Efficiency options

For manual yard washing, here are some ways to improve water-use efficiency.

- Pre-wet the yard on warm, sunny days with a yard hose or sprinkler.
- Use a scraper or a chain (inside an old yard hose) on the backing gate to break up dung before hosing.
- Wash the yard after each milking.
- Work actively and close to the effluent.
- Hose the yard with high water volume under low pressure.
- Include a timer setting on the yard wash down pump (set a time standard for wash down and train staff to achieve it).
- Consider capturing excess cooler water (that would otherwise go to waste) in tipper drums for yard wash.
- Flood wash with water recycled from the effluent pond (refer to conditions of use from your milk processor).



Plant/vat wash

Use water from Tank 1.

To track plant/vat water use

Wash tubs and hot water cylinders use set amounts of water. Refer to washing routine instructions supplied by the detergent companies.



Efficiency options

Here are some steps you can take to reduce plant/vat wash water use:

- Seek advice from your detergent rep on litres required for hot/cold wash options.
- Refill tanks/cylinder with automatic shut-off (to avoid overflows). Use a toilet cistern and trough floats as proven refill/shut-off options.
- Consider heat exchange or pre-heating to improve energy efficiency.

Milking routines

Procedures and practices during milking affect water-use efficiency. Below are some ways to cut water use.

- ❖ Pre wet bail and yard.
- ❖ Minimise sprinkler/spray washing.
- ❖ Hose little and often (as required) in pit area.
- ❖ Put cups on dry, clean udders (see DairyNZ's SmartSamm – www.smartsamm.co.nz).
- ❖ Implement a calm, consistent routine to reduce stress in animals and, in turn, effluent in the dairy (see DairyNZ's Milksmart – www.milksmart.co.nz).
- ❖ Maintain the dairy (paint/surfaces) to minimise the need for continual wetting.
- ❖ For rotaries, use air jet or other methods instead of water to back cows off.

Efficiency options

Here are a few more tips for efficient water use and to reduce water loss.

- Ensure high standard of water quality (if treatment is required).
- Do regular checks for pump pressure, line restrictions and possible leaks.
- Reduce the number of hand-held hoses in use throughout the dairy.

As a measure of efficiency, yard wash water use should not exceed milk cooling water.

Tips & reminders

Liquid ring vacuum pumps

For the water from liquid ring vacuum pumps, half can be recycled (as long as the temperature is less than 40°C) and half captured for yard wash.

Rotaries

Minimise the number of nozzles in the dairy (use water blaster nozzles). Have "easy clean" surfaces in the dairy.

Manual yard washing

Push effluent – don't blast it! Make sure pump capacity and hose size are compatible, and go for high water volume under low pressure. Install more, shorter hoses (ideally on booms) to reduce hose drag. Train all staff to use the desired approach (for time and water efficiency).

Choosing the right system

Commercial yard washers and flood washing are time efficient but can use a lot of water. Get water-use specs from the manufacturer if installing a new system. Weigh up staff time, power costs and water use when choosing an efficient system for your dairy.

Calculating effluent volumes

Reducing amounts of yard wash down water can significantly reduce effluent storage requirements as per the Dairy Effluent Storage Calculator. See details of the Storage Calculator at www.dairynz.co.nz in the Farmfacts - Environment/Effluent systems section. Look for Farmfact 6-15.

Green water reuse

Recycling green water (from effluent) to flood wash the yard is an excellent way to further reduce water use. It has the added benefit of making effluent management easier and could reduce the storage capacity you require. Amendments to the New Zealand Food Safety Authority's Code of Practice for the Design and Operation of Farm Dairies (NZCP1) allow for this practice, but there are strict compliance requirements. If you are recycling green water, get advice from your dairy company representative to ensure you are compliant with your terms and conditions of supply.

