

## Checking the cooling fluid to milk flow rate ratio

### Pointers

- Check the ratio at peak milk flow.
- Use a bucket of known volume (i.e. a 20kg detergent container = 23 litre bucket) and a stop watch.
- Flow rate (litres/second) is calculated by dividing the number of litres (L) by the time in seconds (sec) it takes to fill the bucket.

### Method

1. Turn on the plate cooler water pump and record the time taken to fill the bucket at the water discharge point. You should measure at the discharge point to account for any flow rate restrictions in the pipe work downstream of the plate cooler. Calculate the cooling water flow rate. For example if it takes 15 seconds to fill a 23L bucket the flow rate is  $23/15 = 1.5\text{L/sec}$ .
2. At the next milking, if it is easy to do, record the time taken to fill the bucket with milk at the tank entry point. For example it may take 45 seconds to fill a 23L bucket ( $23 \text{ divided by } 45 = 0.5\text{L/sec}$ ). Aim to take this measurement while the milk pump is working at capacity (i.e. lots of clusters attached to cows at peak milk flow – just after cupping up a whole side). For larger dairies and bottom loading tanks these measurements are best undertaken using water (instead of milk) at a simulated milking.
3. Divide the cooling fluid flow rate by the milk flow rate to determine the ratio. In our example this would be 1.5 divided by 0.5 = 3. Therefore the cooling fluid flow rate is 3 times the milk flow rate – a ratio of 3:1. This ratio would indicate that the problem lies elsewhere as it is in the correct range.

### Note:

Improving the efficiency of plate cooling is likely to require the services of a skilled technician. Cleaning the plates is not an easy task – it is time consuming and best left to experts. Inefficient systems may need resizing, extra pumping capacity, additional cooled water storage or a complete dismantle and service. The additional capital and service costs should be considered against the annual costs of using an inefficient plate cooler. The cost of an inefficient plate cooler increases in proportion to the annual milk production of the farm.