DairyNZ Milksmart

# Calculating Max T

Max T is determined using Table 1, which is based on the average yield of a group of cows at that milking. Basing the Max T on the average yield is important. For labour productivity benefits, cows that have an individual yield that is higher (or lower) than the average, need to conform with the time taken to milk out the majority of their herd mates.

Individual cows producing 30% more than the average yield are classed as ‘elite’ and may be significantly under-milked if subjected to the same Max T as the group. However, it is also counter productive to set Max T based on a high yield that is not achieved by most cows in the herd. A good solution is to give ‘elite’ cows a separate Max T based on their individual yield.

## *Calculating Max T - Basic steps for all dairy types*

**Step 1. Determine the mean daily milk yield per cow**

The aim of Step 1 is to determine the average yield (litres) per cow per day. To do this, calculate the average milk yield in litres of the highest producing group of cows for a milking. Milk statements or a prediction of expected yield at peak are needed. Calving pattern will have some bearing on the correct yield to use. Refer to Table 2.

For example:

In a seasonally calving herd, if the cows have a fairly uniform milk production, the average yield per cow per milking of the herd can be used as the basis for determining Max T. In early lactation use the average yield expected at peak. After peak, use the average yield figures calculated from the daily bulk milk tank volume.

**Step 2. Work out the am and pm milk yield**

The Max T for the AM and PM milking may be different if the yield expected at these two milkings differs. Table 3 shows the litres of milk that can be expected at AM and PM milkings over a range of different daily yields and inter-milking intervals.

Using Table 3:

Identify the average milk yield per cow for the herd (from Step 1).

Identify relevant milking interval for your operation.

Read off the average yield that is expected for the AM and PM milkings.

**Step 3. Determine Max T for am and pm milkings**

Look up the Max T applicable for the AM and PM milk yields using Table 1. This is the longest time that a cluster should be on a cow, with the possible exception of ‘elite’ cows. Check fortnightly for changes in production and adjust the Max T accordingly if required.

**Step 4. Identifying ‘elite’ cows (optional)**

Don’t assume that a high yielding cow must be excluded from Max T. Many ‘elite’ cows with exceptionally high production will often milk-out within the allocated Max T based on the average yield. This is because these cows also tend to have high milk flow rates.

As a general rule an ‘elite’ cow is defined as one that has a milk yield (litres) greater than 30% above the group average yield. These cows can be identified from a recent herd test or using milk meters. Some farmers may wish to make exceptions for ‘elite’ cows, excluding them from the Max T milking regime, or giving them a separate Max T of longer duration. If this is so, it is advisable to exclude their yield results from the mean milk yield calculation for the rest of the herd.

NB. Information in Table 1 and Table 3 is derived from Australian research. New Zealand research to date supports Australian findings and suggest these figures are just as relevant of New Zealand herds.

## *Tables for calculating Max T*

| Yield per milking | Max T (min:sec) | MaxT (decimal minutes) | Yield of 'elite' cows |
|---|---|---|---|
| 7 | 04:51 | 4.8 | 9+ |
| 8 | 05:20 | 5.3 | 10+ |
| 9 | 05:48 | 5.5 | 12+ |
| 10 | 06:15 | 6.3 | 13+ |
| 11 | 06:42 | 6.7 | 14+ |
| 12 | 07:07 | 7.2 | 16+ |
| 13 | 07:32 | 7.5 | 17+ |
| 14 | 07:57 | 8.0 | 18+ |
| 15 | 08:21 | 8.3 | 20+ |
| 16 | 08:44 | 8.7 | 21+ |
| 17 | 09:07 | 9.2 | 22+ |
| 18 | 09:30 | 9.5 | 23+ |
| 19 | 09:52 | 9.8 | 25+ |
| 20 | 10:14 | 10.2 | 26+ |
| 21 | 10:36 | 10.6 | 27+ |
| 22 | 10:57 | 11.0 | 29+ |
| 23 | 11:18 | 11.2 | 30+ |
| 24 | 11:39 | 11.6 | 31+ |
| 25 | 12:00 | 12.0 | 33+ |
| 26 | | | 34+ |
| 28 | | | 36+ |
| 30 | | | 39+ |
| 32 | | | 42+ |

| | | | |
|---|---|---|---|
| 34 | | | 44+ |
| 36 | | | 47+ |
| 38 | | | 49+ |
| 40 | | | 52+ |

*Table 1. Estimator of maximum milk out times.*

Note: The shaded sections of the table indicate yields at which there is limited data available on which to base the expected Max T. Modelling has been used to predict suitable Max Ts.

| Calving pattern | Stage of lactation | Max T to be based on… |
|---|---|---|
| **Seasonal** | Lead up to herd peak | Average yield per cow per milking expected at peak |
| | Peak and post - peak | Average yield per cow per milking |
| **Split calving** | Lead up to peak | Average yield per cow per milking of the most recently calved group, expected at peak |
| | Peak and post - peak | Average yield per cow per milking of the most recently calved group |
| **Year round** | Mixed (early & late) | Average yield per cow per milking of the most recently calved group, expected at peak. |

*Table 2. Herd groups used in setting MaxT.*

| **daily milk yield (L/day)** | **Milking Intervals (hours) (from start of milking)** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 14 | 11 | 13 | 9 | 15 | 8 | 16 | 12 | 12 |
| | evening | morning | evening | morning | evening | morning | evening | morning | evening | morning |
| 8 | 3 | 5 | 4 | 4 | 3 | 5 | 3 | 5 | 4 | 4 |
| 9 | 4 | 5 | 4 | 5 | 3 | 6 | 3 | 6 | 5 | 5 |
| 10 | 4 | 6 | 5 | 5 | 4 | 6 | 3 | 7 | 5 | 5 |
| 11 | 5 | 6 | 5 | 6 | 4 | 7 | 4 | 7 | 6 | 6 |
| 12 | 5 | 7 | 6 | 7 | 5 | 8 | 4 | 8 | 6 | 6 |
| 13 | 5 | 8 | 6 | 7 | 5 | 8 | 4 | 9 | 7 | 7 |
| 14 | 6 | 8 | 6 | 8 | 5 | 9 | 5 | 9 | 7 | 7 |
| 15 | 6 | 9 | 7 | 8 | 6 | 9 | 5 | 10 | 8 | 8 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 7 | 9 | 7 | 9 | 6 | 10 | 5 | 11 | 8 | 8 |
| 17 | 7 | 10 | 8 | 9 | 6 | 11 | 6 | 11 | 9 | 9 |
| 18 | 8 | 11 | 8 | 10 | 7 | 11 | 6 | 12 | 9 | 9 |
| 19 | 8 | 11 | 9 | 10 | 7 | 12 | 6 | 13 | 10 | 10 |
| 20 | 8 | 12 | 9 | 11 | 8 | 13 | 7 | 13 | 10 | 10 |
| 21 | 9 | 12 | 10 | 11 | 8 | 13 | 7 | 14 | 11 | 11 |
| 22 | 9 | 13 | 10 | 12 | 8 | 14 | 7 | 15 | 11 | 11 |
| 23 | 10 | 13 | 11 | 12 | 9 | 14 | 8 | 15 | 12 | 12 |
| 24 | 10 | 14 | 11 | 13 | 9 | 15 | 8 | 16 | 12 | 12 |
| 25 | 10 | 15 | 11 | 14 | 9 | 16 | 8 | 17 | 13 | 13 |
| 26 | 11 | 15 | 12 | 14 | 10 | 16 | 9 | 17 | 13 | 13 |
| 27 | 11 | 16 | 12 | 15 | 10 | 17 | 9 | 18 | 14 | 14 |
| 28 | 12 | 16 | 13 | 15 | 11 | 18 | 9 | 19 | 14 | 14 |
| 29 | 12 | 17 | 13 | 16 | 11 | 18 | 10 | 19 | 15 | 15 |
| 30 | 13 | 18 | 14 | 16 | 11 | 19 | 10 | 20 | 15 | 15 |
| 31 | 13 | 18 | 14 | 17 | 12 | 19 | 10 | 21 | 16 | 16 |
| 32 | 13 | 19 | 15 | 17 | 12 | 20 | 11 | 21 | 16 | 16 |
| 33 | 14 | 19 | 15 | 18 | 12 | 21 | 11 | 22 | 17 | 17 |
| 34 | 14 | 20 | 16 | 18 | 13 | 21 | 11 | 23 | 17 | 17 |
| 35 | 15 | 20 | 16 | 19 | 13 | 22 | 12 | 23 | 18 | 18 |
| 36 | 16 | 21 | 17 | 20 | 14 | 23 | 12 | 24 | 18 | 18 |
| 37 | 15 | 22 | 17 | 20 | 14 | 23 | 12 | 25 | 19 | 19 |
| 38 | 16 | 22 | 17 | 21 | 14 | 24 | 13 | 25 | 19 | 19 |
| 39 | 16 | 23 | 18 | 21 | 15 | 24 | 13 | 26 | 20 | 20 |
| 40 | 17 | 23 | 18 | 22 | 15 | 25 | 13 | 27 | 20 | 20 |
| 41 | 17 | 24 | 19 | 22 | 15 | 26 | 14 | 27 | 21 | 21 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 42 | 18 | 25 | 19 | 23 | 16 | 26 | 14 | 28 | 21 | 21 |
| 43 | 18 | 25 | 20 | 23 | 16 | 27 | 14 | 29 | 22 | 22 |
| 44 | 18 | 26 | 20 | 24 | 17 | 28 | 15 | 29 | 22 | 22 |
| 45 | 19 | 26 | 21 | 24 | 17 | 28 | 15 | 30 | 23 | 23 |
| 46 | 19 | 27 | 21 | 25 | 17 | 29 | 15 | 31 | 23 | 23 |
| 47 | 20 | 27 | 22 | 25 | 18 | 29 | 16 | 31 | 24 | 24 |
| 48 | 20 | 28 | 22 | 26 | 18 | 30 | 16 | 32 | 24 | 24 |
| 49 | 20 | 29 | 22 | 27 | 18 | 31 | 16 | 33 | 25 | 25 |
| 50 | 21 | 29 | 23 | 27 | 19 | 31 | 17 | 33 | 25 | 25 |

*Table 3. Morning and afternoon yield (estimated from daily yield at different milking intervals).*