

INPUTS (yellow)**Measurements per month**

yield : **How many times(pm+am) per month are individual cows milk yields recorded?**

For example:

- 1.0- for monthly pm+am herd testing,
- 30.0- for situations where you record individual cow milk yield every day (with permanent in-place meters) and use and use all results
- 0.5- for situations where you measure milk yield only at one milking per month (am or pm) e.g. Tasmanian herd test.
[Note this an over simplification and we expect to make a better model to predict precision of alternate pm/am recording regimes]

fat% : **How many times per month (pm+am) are individual cows are milk sampled**

For example:

- 1.0- for monthly pm+am herd testing,
- 0.5- for situations where you sample milk only at one milking per month (am or pm) e.g. Tasmanian herd test.
[Note this an over simplification and we expect to make a better model to predict precision of alternate pm/am recording regimes]

months per lactation : **How many periods or months per lactation do you collect samples and record m**

For example:

- 9- for monthly herd testing (for both Pm+am & pm/am regimes)
- 4- for bimonthly herd testing (e.g. NZ herd test)

precision of herd testing devices or equipment

Device CV% is a statistical measure of the precision of or the confidence that we can have in a single result when estimated by the device. CV% is the standard deviation of precision expressed as a percentage of the mean.

What is the precision (CV%) of the milk meter and the milk sampler?

2.5- is the expected precision for both ICAR approved milk meters and milk samplers

[Note: A range of other alternative precision values are used in the table that are used to demonstrate the small effect that device precision has on lactation precision. These values of 5.0, 7.5, 10.0 simply represent precision values that are 2, 3 and 4 times greater than those specified by ICAR. You can enter different sampler and meter precision values, e.g 2.5 and 5.0 respectively]

Exercise:

Try another set of inputs representing:

- more or less precise equipment,
- more or less frequent sampling and / or yield recording,
- and see how the lactation precision changes.

OUTPUTS (blue)**Interpretation:**

Higher CV% values indicate lower precision.

Compare your precision values with those that are shown for testing regimes that you know and are confident about

The example regimes represent regimes already common or available soon with alternative milk meters and sampler technology. The output CV% values show that the precision of the meter and sampler have only a small bearing on the precision of herd testing.

Herd Testing Regime Precision Test Tool

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[See Instructions sheet for help](#)

REGIME DESCRIPTION	INPUTS					OUTPUTS				
	Measurements per Month		Months per Lactation	Device CV%		Period CV%			Lactation CV%	
	milk yield	fat %		meter	sampler	milk yield	fat %	fat yield	milk	fat yield
Your regime - enter your values in yellow cells B9 to F9	1.0	1.0	10	12.5	2.5	11.2	13.5	17.5	3.53	5.53
Precise meter and sampler used monthly (Victorian HT using equipment which meets ICAR precision)	1	1	9	2.5	2.5	7.0	13.5	15.2	2.34	5.07
Perfect meter and sampler used monthly (not practical)	1	1	9	0.0	0.0	6.8	13.4	15.0	2.27	5.00
Moderate precision meter and sampler used monthly (meters and samplers with double ICAR allowable imprecision)	1	1	9	5.0	5.0	7.7	13.9	15.8	2.55	5.27
Medium precision meter and sampler used monthly (meters and samplers with triple ICAR allowable imprecision)	1	1	9	7.5	7.5	8.6	14.4	16.8	2.87	5.59
Low precision meter and sampler used monthly (meters and samplers with four times ICAR allowable imprecision)	1	1	9	10.0	10.0	9.8	15.2	18.0	3.27	6.01
Precise meter used daily and sampler used monthly (Victorian HT using equipment which meets ICAR precision)	30	1	9	2.5	2.5	1.3	13.5	13.6	0.43	4.53
Moderate precision meter used daily and sampler used monthly (meters and samplers with double ICAR allowable imprecision)	30	1	9	5.0	5.0	1.4	13.9	13.9	0.47	4.64
Medium precision meter used daily and sampler used monthly medium precision meter and sampler used monthly	30	1	9	7.5	7.5	1.6	14.4	14.5	0.52	4.83
Low precision meter used daily and sampler used monthly (meters and samplers with four times ICAR allowable imprecision)	30	1	9	10.0	10.0	1.8	15.2	15.3	0.60	5.09
Precise meter and sampler used bimonthly (New Zealand HT using equipment which meets ICAR precision)	1	1	4	2.5	2.5	7.0	13.5	15.2	3.51	7.60

Murray Hannah:
large data set, 208 cows, 294 days full lactation, CV calculated within each animal within week and averaged. Corrected for measurement error (CV 2.5%) gave 6.8%

	Day to day CV%		
	Daily	AM	PM
Milk	6.8		
Fat%	13.4	13.26	16.35
Cov(milk/fat)	-0.39	-0.41	-0.38

Murray Hannah:
covariance between daily milk yield and PM fat%

Murray Hannah:
From Clarke & McGowan 1984, corrected for measurement error CV 2.5%

Murray Hannah:
covariance between daily milk yield and AM fat%