



Fiji TechNote 2 – Instructions for Testing Milking Machines

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All the equipment needed for testing milking machines should be in one personal tool kit built up as needed. For convenience try to keep all the necessary tools together.

The testing kit

- Teat cup plugs (they make the pulsation check better)
- Big multi-grips to open pipes
- An adjustable spanner, two sizes, usually 300mm and 150mm
- Small and large screwdrivers
- Tape measure
- Small 150mm steel ruler to measure liners
- Small torch plus batteries
- Different sized rubber sleeves and plugs
- Masking or duct tape to block leaks until they can be fixed properly

Testing the vacuum level

1. Start the milking machine and fit the teat cup plugs to all liners, then open the vacuum taps. The test can still be done without plugs but with less accuracy; the vacuum may be higher without plugs especially with a low-quality regulator.
2. Open up the long milk tube at one claw and fit the vacuum gauge. Check before using it to see that it is not out of adjustment.
3. Hold the vacuum gauge upright, read and record the vacuum reading.



Adjusting the regulator

1. These are often quite different in design and so you need to learn how to adjust each one. Some such as the old Ruakura Black are not easily adjustable.
2. Adjust the vacuum level according to the height of the milk line using Table 1 overpage.

Table 1. Adjusting vacuum level settings.

Milk line height above cow's feet	Best vacuum level setting
Low line or bucket milker	40 kPa
Milk line 1.2 metres high	42 kPa
Milk line 1.4 metres high	44 kPa
Milk line 1.6 metres high	46 kPa
Higher milk lines	Keep vacuum level no higher than 46 kPa

Testing the pulsation ratio

1. Fit the small T-piece into the short pulse tubing near the claw.
2. Start recording for two complete pulsations or more.
3. Use a ruler or plastic graticule to measure the ratios unless you have a minitester that does this for you.



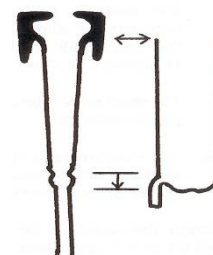
The pulsation ratio should be between 50% and 65%. The 'd' or 'rest' phase should be more than 20%.

Testing the pulsation rate

Use a watch to measure the rate – or a minitester if you have one. The rate should be between 50 and 60 pulsations per minute.

Testing liners – a four step process

1. Look at the mouthpiece. Is it distorted, out of shape? Does the outside of the liner look perished? If so, it may be at the end of its useful life.
2. Measure the length of the liner where it fits the shell, using a small steel ruler. It should be shorter than the shell by at least 7mm. A stretched liner does not milk the cows properly.
3. Squeeze the liner or fold it over where it normally folds flat and look for perished marks or small splits. If they are found, the liner is worn out and can split open any time during milking to cause a milk quality penalty.
4. Look through the liner for a rough surface instead of the original smooth surface. If the rough surface is more than about half the internal length you can see, it is worn out.



In conclusion, if the liner fails any one of these four checks it should be replaced. Normally liners have an effective life of around 2500 to 3000 milkings depending on the material used and how well they are cleaned.



Other visual faults that should be fixed

Milk lines with the inlets not in normal 2 o'clock position. If hanging below the 3 o'clock position, rotate until they are correct. Fasten milk line tightly or use wire to hold the inlets up.

Sagging rubber tubing. This slows milking and may turn milk into butter. Shorten them so they hang properly on the cow.

Dirty milk lines, seals, plugs, receiver, claws, etc. Start proper cleaning procedures. Replace any perished rubber ware.

Check to see air admission holes in the claws are all clean.

Milk cans left upright after cleaning? Fit nails into posts and hang the cans from there or build a rack so the cans can be left upside down to drain and dry.

Visual observations

Check the whole machine for obvious air leaks and fix if found.

Check the milk line inside using a torch looking for faulty seals and milk deposits (i.e. poorly washed areas).

Identify the regulator. Check its operation by letting in air through a cluster so the vacuum level drops. Then close the tap and watch the vacuum gauge, fitted in any convenient place. The vacuum level should rise back to the original level reasonably quickly (a guideline is three seconds) and settle quickly. Using the same method, check the farm gauge as these are often faulty.

Look at all seals and components of the machine to see if there is any need for replacement.

Reporting

Complete a short report on the test results plus your recommendations as necessary.

The aim is to build up a lasting record of the farm and start the process of upgrading if necessary.

