

dairying

The art of milk machine maintenance



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MILKING machines should be fully serviced and tested at least once a year by a qualified milking machine technician, twice a year would be better. Regular servicing and testing will help prevent high cell count and other problems attributable to the milking machine. If there is a problem, have the machine tested before any parts are replaced or alterations made, and again after servicing to make sure it is working properly again. The milking machine technician should write a test report listing any faults and recommendations and discuss them with you.

Maintenance Checks

There are some maintenance checks that you can do yourself. A lot of the maintenance is flexible, requiring only checking from time to time, but you need to know what to look for.

Vacuum Gauge

An unusual reading indicates a problem with either the vacuum regulator or the gauge. The gauge should be visible during milking, ideally from the pit, and when the machine is turned off it should read zero. The recommended vacuum level for midi-level milking machines is in the range 47kPa to 50kPa. The vacuum level would usually be set at about 48kPa. If the scale is in inches or centimetres, the recommended range is 13.8 to 14.8 inches or 35 to 37.5cm.

When the needle lines up with the red pointer (marking the right level) you can see at a glance if the vacuum level is normal. If the accuracy is out by more than 1kPa, or the needle doesn't return to zero, replace the gauge.

Vacuum regulator

If the correct vacuum is maintained, the regulator is set correctly and working properly. If the vacuum level is too low, milking will take longer, too high and teat end damage, mastitis and raised cell counts may result.

If there is no hissing sound from the

regulator during milking, either the vacuum reserve is low, the regulator is faulty, or there are air leaks in the machine, probably because basic maintenance has been neglected.

Clean the vacuum regulator air intake and spongy foam filter(s) by washing in warm water and mild detergent. Dry the spongy foam filter by squeezing it in a dry cloth. The inside of the vacuum regulator will usually stay fairly clean if the filters are in good condition and cleaned regularly. If the outside of the regulator is dusted down and the filters kept clean, the inside of the regulator should only need to be cleaned by your technician at a service visit.

A dirty air inlet valve inside the regulator can result in a loss of vacuum reserve, while the vacuum gauge reads normally. Air can leak in through the regulator when it's supposed to be closed, because the dirt won't allow the valve to seat properly.

Pulsation Airline

Washing out the airline and cleaning and checking the operation of the drain valve is all that's required. The airline gets dirty because of dirt sucked in through cracks/holes in the long and short pulse tubes, and possibly milk and/or detergent solution sucked in through the odd cracked liner.

Airlines should be flushed with a hot detergent solution and thoroughly rinsed out with hot water. The general recommendation is to do this twice a year and whenever you get a cracked liner.

Use the tap or bung at the end of the line to suck in the cleaning solution. Draw no more than about three-quarters of the capacity of the interceptor through at a time. Pneumatic relays and some electronic relays can be washed by sucking the wash solution through the long pulse tubes.

Your milking machine users' manual outlines the correct procedure for this, e.g. some pulsation control boxes have service switches on them to allow continuous suction through the long pulse tubes and relays for washing.

Where two pulse tubes are connected to the same relay, suck up wash solution through both at the same time, otherwise some wash solution may end up between the liners and the shells. Very dirty airlines with dried-in dirt will need a more thorough cleaning operation, e.g. partial





Flattening of the long milk tube at the milk entry to the milk line. Milking takes longer and cell counts can be adversely affected.



Regular cleaning of the filters on the vacuum regulator is essential.

dismantling, use of pull throughs, etc.

There should always be a drain valve at the low point on the pulsation airline. This drain valve should not allow any air to leak in during milking, but should allow any liquid in the line to drain out when the machine is turned off. The airline should also slope towards the drain valve. Look for a cracked liner if milk is seen dripping from the drain valve.

Pulsation

Pulsation tests by your milking machine technician should confirm that all is well. You can check the pulsation rate yourself by inserting your thumb into a liner and counting the number of pulses in 15 seconds. The recommended rate is 60 cycles per minute.

You cannot measure the ratio yourself, but you can check that liners are collapsing on the teats. Again, with your thumb inserted into a liner (with shut off valve open), check that a liner is fully collapsing on your thumb, indicating, at least, that the teat isn't under continuous high vacuum during milking.

Vacuum pump and motor

Check the oil level in the vacuum pump and top up as necessary. There should only be about 12mm play with firm thumb pressure on the belts. Have a spare set of belts on hand. If belts have to be replaced or tightened, be sure to maintain pulley alignment. Always isolate power supply for this type of work and replace safety guards afterwards.

Flush out vacuum pumps with diesel about twice a year. Be careful not to start the machine with a lot of diesel in the pump, which could damage the vanes. A quick way to flush out the vacuum pump is to gradually suck some diesel in at the test point near the pump, by pouring it slowly and letting the suction take it in and blow it out through the exhaust.

Clusters and liners

Every day, you should check that the claw

air bleeds are clear. You can get a small stainless steel probe specifically for this. Look for liners which are twisted in the shells. The arrows on the mouthpiece and short milk tubes should be in line. Check for internal cracks in the liner and cracks/holes in the short milk tubes. Examine claw seal kits and replace as necessary.

Shut-off valves that don't seal properly at cluster take-off, as it can cause clinical mastitis and raised cell counts. Chipped or cracked claw bowels should be replaced.

Have ACR's serviced and calibrated by your milking machine technician, so that cows are fully milked out but not over-milked, and vacuum shut off and cluster removal are timed correctly.

Change liners on time because, as they age, they lose tension and shape, which lengthens milking time and leads to raised cell counts. Research has shown that the expected life of a liner is about 2,000 milkings, and that milk yield is reduced by about 5% if you use liners for much longer than that. With 84 cows and 12 units and milking twice per day, you should change liners after about 143 days. The cost of replacing liners for this 12-unit parlour is about €300. If the cows are milking about 18 litres each per day, a 5% loss costs €19 per day for the herd and the cost of replacing liners is recovered in about 16 days.

Milklines

A common problem with milklines is that they have an insufficient slope and this should be rectified urgently. Poor slopes/dips in milklines cause low and fluctuating vacuum at the teat end and hampers cleaning and drainage of the machine. An even and continuous slope of about one in 67, i.e. 1.5% is ideal. Check the slope with a spirit level. A slope of one in 67 is about 4.5mm with a 300mm long spirit level. Dips in the milkline, especially at the entry to the receiver, are also common.