

Topic

Topic

Environment



Technical efficiency



ENCOURAGING IMPLEMENTATION OF VARIABLE SPEED DRIVE VACUUM PUMPS, USE OF MILK PRE-COOLING AND OPTIMISATION OF WATER HEATING CYCLES TO REDUCE ELECTRICITY USE

Background

The current scenarios of climate change and climate crisis make it necessary to work, in all aspects, much more efficiently and economically. In the dairy sector, conventional vacuum pump systems most often do not take into account air demands, with this varying widely throughout the cycle. The Variable Speed Drive determines exactly how much vacuum the system requires and regulates the speed of the pump. The result is a pump that runs at a much lower speed most of the time and requires less electricity to do the job. In addition, the heat released by the cooling tanks can be used for water heating. With these two measures, more and more farmers can improve energy efficiency, and reduce energy and water consumption, as well as CO₂ emissions.



Objectives of both solutions

Adapt to the energy needs required by the milking process, reducing electricity and water consumption

Improve the productivity of milking and the farm in general.

How does the first strategy work?

Milking machines need a lot of electrical power to do their job, and their motors should match exactly what the process in question requires to use only the energy needed:





Variable speed pumping equipment offers the possibility of setting the required pressure in the system and varying the speed of the pump according to the demand of the milking process, also preventing the deterioration of the machine, as it avoids unexpected stops.

The image shows the industrial regulator, which would be between the power supply and the motor. The equipment regulates the energy before it reaches the motor and then adjusts the frequency and tension according to what the milking requires.



Positive features of 1st solution

- Energy and economic savings > 60%.
- It runs at half the RPM.
- Reduced wear of the vacuum pump.
- Option to switch between variable speed and constant speed operation.
- It can be installed to operate a second reserve vacuum pump.

Topic	Topic	ENCOURAGING IMPLEMENTATION OF VARIABLE SPEED DRIVE VACUUM PUMPS, USE OF MILK PRE-COOLING AND OPTIMISATION OF WATER HEATING CYCLES TO REDUCE ELECTRICITY USE
Environment 	Technical efficiency 	

How does the pre-cooling work?

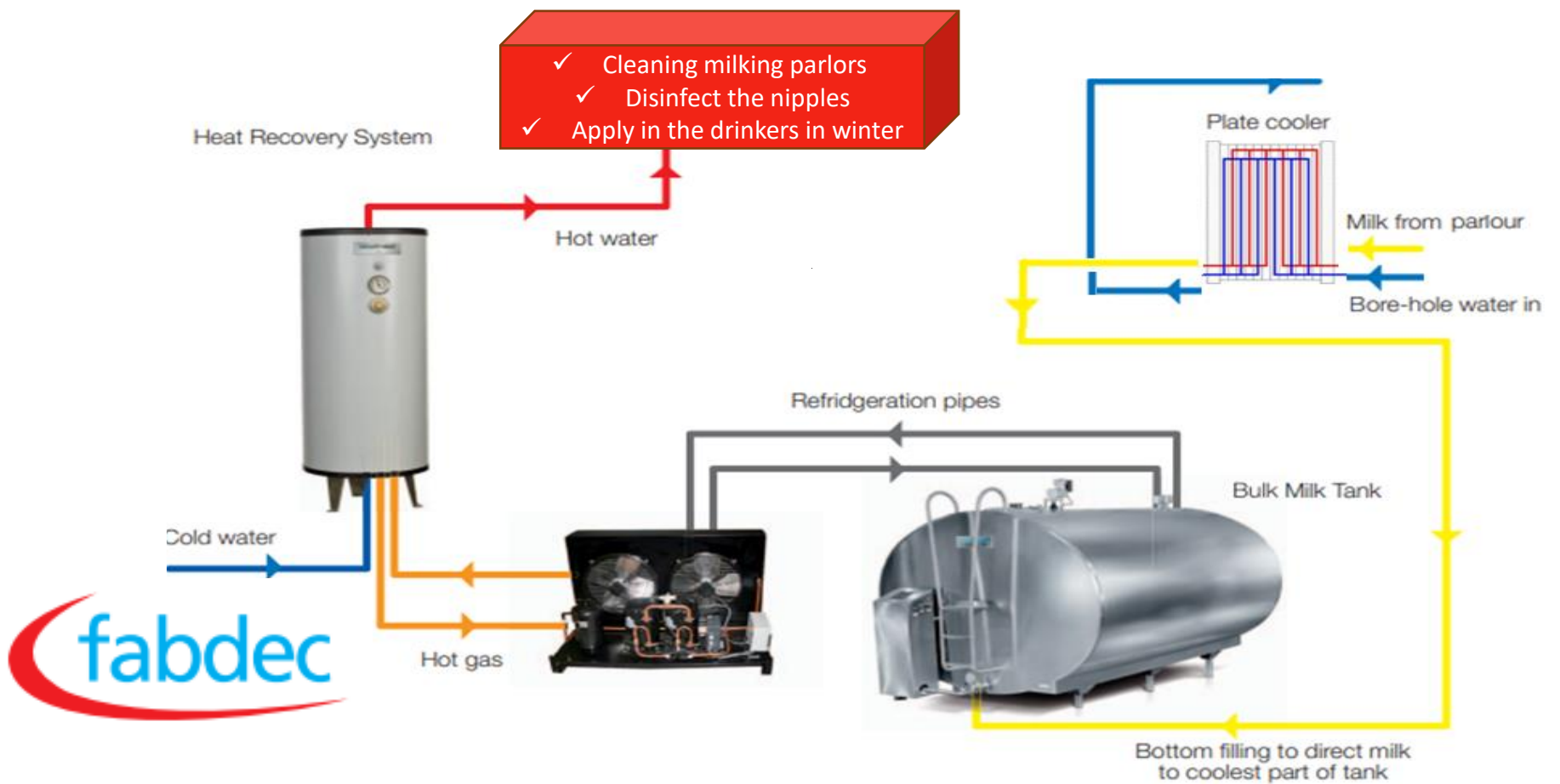
Plate coolers are an efficient way of cooling milk and play an important part in ensuring milk is cooled quickly for storage, reducing the demand for electrical energy.

Milk coming from the parlour passes through a single stage plate cooler which uses mains/bore-hole water to reduce the milk temperature from around 35°C to 18–20°C before it reaches the bulk milk tank, reducing the load on the refrigeration system significantly.

How does the heat recovery work?

The cooling process results in heat loss that can be used to heat the heating elements of the thermos flask, producing hot water, thanks to the gas that has left the compressor.

And since the refrigerant entering the condenser has been partially cooled, there is an improvement in condensing efficiency, resulting in energy savings and extended compressor life.



Positive features of 2nd solution

- Heat recovery. Heating up to 90°C and storage of hot water at 50°C.
- Optimal energy recovery for chillers equipped with a refrigeration unit.
- Made of stainless steel: exceptional corrosion resistance and long service life.
- Fast return on investment.

Assessment of method

