



Managing in wet conditions

Milking without electricity supply

Getting the dairy operational again when the power is out for extended periods is a high priority. Having a contingency plan ready to swing into action is sound risk management and will save valuable time when you most need it.

Getting dairy farms reconnected to the grid is usually a high priority for agencies in the recovery phase of an emergency situation. However, in widespread natural disasters, repairing the power distribution infrastructure to reconnect dairy farms can take many weeks.

Farmers need to be prepared and have a plan ready to implement should the worst occur. If this involves staying on the farm, the plan should include the steps that need to be done to start milking again within 1-2 days.

This Fact Sheet covers the options and considerations for farmers seeking alternative power supplies for their dairies. Forward planning, a team approach and practice are the keys to minimizing the impact of power outages.

The issue

24 - 48 hours after not being milked the milk producing cells in the udder start to shut down. Subsequent milk production is compromised if milking is not re-established (at least once daily) within 2-3 days.

The level of production loss is dependent on the number of missed milkings and the stage of lactation of the individual. Generally cows in early to mid-lactation will recover in production if milking is re-commenced with 3-4 days. Cows in later lactation are more likely to dry off.

Mastitis is also a major issue for cows that are not milked, especially if the power outage is associated with wet muddy conditions.

Getting the dairy operational is also important to feed supplements and manage animal health.

Warnings / Risk management

Connection of any alternative power supply to the fixed wiring of a dairy, house or other circuits must be performed by a licensed electrical contractor.

Most modern automated dairies include equipment that requires a consistent stable power supply. Seek advice from the equipment supplier when planning a contingency power supply.

Rotating belts, pulleys and drive shafts pose very high risks to people. Guards and appropriate safety measures must be in place.

The safety and quality of milk can be affected by power disruption and/or prolonged storage. Contact your factory milk quality representative for advice.

What you will need

Use the table below as a checklist to work out the power required to operate the dairy. Your electrician will need this information when looking at the options for the farm.

- Only include the items that you require to be operational during the power outage
- Early in many emergency situations the milk cannot be collected by tankers so must be dumped. Therefore, a contingency supply which includes power for milk cooling may not be necessary in every instance

- Generator requirements are worked out based on the peak demand. So consider the time of the day that the item is in use. Can the time be changed to reduce peak demand? For example, the refrigeration unit can be turned on after milking is completed and the hot water services turned on after that
- Consider making provisions for the house whilst discussing the options with your electrician

Category	Item	Total power rating (kW)	Power supply requirement		Time of use (if critical)
			480V Single Phase	415V 3-Phase	
Milking	Vacuum pump(s)				
	Rotary platform drive				
	Pulsation system				
	Milk pump(s)				
	Stall gates				
	Feed system				
	Milking point controllers				
	Computer(s) / herd management				
	ID system				
	Compressor(s)				
	Other				
Cooling	Plate cooler pump				
	Cooling tower				
	Refrigeration unit				
	Chiller system				
	Other				
Cleaning	Auto cleaning unit / chemical dosing				
	Hot water – milking machine				
	Hot water - vat				
	Platform/pit wash				
	Yard wash				
	Manure pump				
	Other				
Lighting	Pit				
	Milk room				
	Yards				
	Other				
Stock	Water to drinking troughs				
	Calf feeders				
	Other				

The options

Emergency generators

Diesel/petrol or tractor PTO-driven generators are a good option for dairies in most cases but can be hard to source in wide scale emergencies. Some dairies have a generator permanently installed for such occasions.

- The size of the generator required will vary depending on the peak demand but generators of 40-50kVA capacity should be sufficient for most average size dairy farms
- Installation must be undertaken by a licensed electrical contractor. An inspection by the regulatory authority is often required after installation has been completed
- Unless there is dedicated connection point (e.g. plug) then the generator will need to be hard-wired into the switchboard
- Preparing the switchboard in advance to allow a generator to be plugged in safely is good risk management
- It will usually involve the installation of a changeover switch that switches electrical supply between the mains and the generator
- Licensed electricians are likely to be in short supply early in an emergency response
- Be aware that these generators can be noisy and also produce noxious fumes, including deadly carbon monoxide. Site outside, away from indoor living or work areas
- For tractor PTO-driven generators a “rule of thumb” is: the tractor power needed to drive the generator is about 1.5 times the generator’s capacity. For example, a 50kVA generator will require a 75hp tractor to run it
- Running the dairy from the generator should be practised periodically to ensure staff are familiar with the switch over procedures

- Consider sharing the costs with a neighbour, preparing one dairy as the ‘emergency’ milking site for both properties
- Access to fuel maybe be limited during an emergency so keeping a reserve supply to cover 5-7 days operation is recommended

Direct drive via the tractor (hydraulics or PTO)

For smaller, less automated dairies it is possible to use the tractor’s hydraulics or PTO to drive the vacuum and milk pumps.

- Hydraulic motors are preferable to rotating PTO drive shafts from a safety perspective
- A common drive shaft for the diaphragm milk pump and vacuum pump is required. If the milking machine relies on a centrifugal milk pump then a generator will be required
- Consider permanently installing hydraulic or PTO connection systems (hydraulic lines, drive shaft extensions, pulleys etc) to enable an easy and safe changeover
- Guard all belts, pulleys, PTOs and associated rotating drive shafts before use
- Some electronic pulsation systems can be powered directly from a battery but this is suitable for short term outages only, before the battery needs recharging

Milking at a neighbouring farm

In some circumstances it may be possible to walk the herd to a neighbouring farm for milking.

- Talk to your neighbours about how you could help each other out in an emergency
- Moving cattle between farms poses significant disease/biosecurity risks so needs careful consideration
- Sharing equipment may be a better option. Consider purchasing a generator together and share it as required

Further resources

More information on managing in wet conditions is available at <http://www.dairyaustralia.com.au/wet-conditions>

For further information, please contact:

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