

Preparing for power outages

When power supply is disrupted, being ready with a contingency plan will save time to start and keep the dairy operational. Forward planning, a team approach and practice are the key steps to minimise disruption to your business.

1 Milking without power

Your plan should aim to minimise missed milkings. Work on the basis that restoration of power could take days.

2 The effect of missing milkings on cows and milk production

The milk producing cells in a cow's udder will begin to shut down after 36 hours of not being milked. To minimise future production losses, milking should be re-established at least once daily after 48 hours.

The level of production loss will be dependent on the number of missed milkings and the stage of lactation of the individual cow. Generally cows in early to mid-lactation will recover if milking can resume within three to four days. Cows in later lactation are more likely to dry off.

Mastitis is also a major risk to cow health and milk quality, especially if the power outage is associated with wet, muddy conditions.

3 How to calculate your power requirements

Use **Table 1** as a checklist to work out the power required to operate the dairy. Then talk to your electrician to plan alternative power options for your farm.

- Only include items you will definitely need to use during a power outage.
- Think about 'what if' the farm cannot be accessed by the milk tanker? Is it feasible/cost effective to increase vat storage space and does your contingency plan include sufficient power to cool the milk?
- Generator requirements are worked out on the basis of peak electricity use and motor starting needs. Consider the time of the day each item is in use. Can use be staggered to reduce peak power use? For example, consider turning the hot water services on after the milk has cooled. Note the affect on milk quality.
- Weigh up all the relevant costs and benefits of alternative power sources. A smaller generator could save you in capital investment, but have longer term impacts, for example, on milk quality.

Five-step plan

1. Do you know your total power requirements?

Calculate how much electricity is required to run your dairy.
See **Table 1**

2. Have you made provisions for domestic/household power needs?

How will you cook, heat water or run water pumps?

3. Have you organised an alternative power supply?

Consider the best back-up option to power the dairy?
Will you buy, hire, or share with neighbours?

See **Section 4**

4. Do you have a professionally installed hardwire switch for the alternative supply?

See **Section 5**

5. Do you have a disposal plan in place for waste milk on farm? the alternative supply?

See **Section 6**



Domestic household requirements

Consider whether your domestic power needs can be met during a prolonged outage.

- How will you heat water and cook?
- How will you charge your mobile phone? Consider investing in a car USB cable and/or a solar charger.
- Do you have a supply of batteries for your radio and torches?
- Where is your written list of important phone numbers (power company, electrician, milk company etc.)?

4 Alternative power sources

Generators

Diesel/petrol or tractor PTO-driven generators are a good option for dairies.

- Generators of 40–50 kVA capacity should be sufficient for most average size dairy farms (250 cows).
- The tractor power needed to drive the generator is about 1.5 times a PTO-driven generator's capacity. For example, a 50 kVA generator will require a 75 hp tractor to run it.
- As access to fuel may be limited, keep a reserve supply to cover 2–5 days of operation.

Direct drive via the tractor (hydraulics or PTO)

For smaller and/or less automated milking systems, a tractor's hydraulics or PTO-shaft can be used to drive the vacuum and milk pumps.

If the milking machine relies on a centrifugal milk pump, a generator will be required.

- Hydraulic motors are a safer option than a rotating PTO drive shaft.
- A common drive shaft can be used to power a diaphragm milk pump and vacuum pump.
- Consider permanently installing hydraulic or PTO connection systems (hydraulic lines, drive shaft extensions, pulleys etc.) to enable an easy and safe changeover.
- Some electric pulsation systems can be powered for short periods directly from a battery.
- Guard all belts, pulleys, PTOs and associated rotating drive shafts before use.

If no alternative sources of power are suitable:

First, talk to your neighbours. Can you share a generator and agree a plan on how it will be used in an emergency (transport, timing, frequency)?

In some circumstances, you may need to walk the herd to a neighbouring dairy farm for milking. Talk to your neighbours about how you could help each other, as a last resort¹.

¹Your must notify your milk processor and dairy food safety authority before milking in another dairy.

Moving cattle between farms can be stressful for everyone and poses a number of biosecurity and other risks. It is vital therefore that when planning to move cows between farms that you completely understand and recognise the milk quality, health, biosecurity and regulatory considerations associated with this activity.

For further information on these considerations search for the Cow Parking fact sheet on the Dairy Australia website at dairyaustralia.com.au

Finally, if you need to milk at a neighbouring farm ensure your plan notes the need to completely wash down the dairy between herds.

5 Connection and safety requirements

Think ahead

- It can save a lot of time and stress if you prepare your switchboard in advance. Generally you will need to install a changeover switch – to switch supply from the mains to the generator. Hardwiring a dedicated switch must be performed by a licensed electrical contractor. In an emergency, licensed electricians are likely to be in short supply so plan ahead.
- Modern dairies require a consistent, stable power supply. Seek advice from equipment suppliers when planning your alternative power source.

Don't forget plan ahead as hired generators may be hard to source after a natural disaster or local emergency. And think about fuel type and safe storage if you live in a fire prone area.

Think safety

- Rotating belts, pulleys and drive-shafts need appropriate guards and safety warnings.
- Think about fumes and noise. Position tractor generators outside, away from housing or work areas.
- Think food safety and quality of milk. Liaise with your company Field Service Officer for advice.

Practice regularly

Operating the dairy using the alternative supply should be practiced periodically to ensure everyone is familiar with the switch-over procedures and to check the equipment functions as intended. Is your emergency/contingency plan up to date? We recommend you read and refresh your plans annually.

Table 1 Calculating your power requirements

Category	Item	Total power rating (kW)	Power supply required		Time of use (if critical)
			480 V Single Ph	415 V 3-Ph	
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				
Stock	Water to drinking troughs				
	Calf feeders				
	Other				

6 Milk disposal on farm

If milk cannot be collected by tanker, it will need to be destroyed or utilised on farm. There are several suitable options:

- Waste milk can be diluted 1:10 with water and spread on pasture.
- A maximum of two days milk can be added to a well-functioning pond with minimal adverse effect. Milk can, however, affect the function of an effluent pond because of its high Biological Oxygen Demand (BOD) and organic loading.
- Milk can be fed to calves if there are suitable storage facilities available to prevent spoilage.

- Digging a dedicated pond or trench is another option, provided you have suitable soil to prevent milk leaching into groundwater.
- Always ensure that waste milk cannot run-off to waterways.

FOR FURTHER INFORMATION

Refer to the Dairy Australia website at dairyaustralia.com.au/ and search for information on Mastitis and Extreme Weather.