Every year people are killed and seriously harmed in dairies in New Zealand, with on average 6 people dying per year. Many of the injuries are caused by either being crushed or caught by moving machinery.

It is an employer’s obligation under the Health and Safety Act 1992 to eliminate, isolate and minimise any hazards in the workplace. Even if you are fully aware of the dangers in the dairy, some of which may have been there for years, new staff, visitors and children may not be aware of the danger, in saying that experienced farmers are also at risk of coming to serious harm on their farms. See the DairyNZ Compliance Tool Kit for more information about your obligations as an employer, health and safety on the farm and training staff.

**Benefits**

Include safety considerations in new dairy design

- Ensure the dairy meets Health and Safety requirements.
1.1 General

Concrete

Concrete surfaces need to be rough enough to minimise the risk of cows or people slipping. If too smooth roughen the surface by etching with acid, grooving or scabbling.

![Scabbler roughening a concrete yard.](image1)

Figure 1. Scabbler roughening a concrete yard.

Steps

Use concrete in preference to steel which will eventually rust through. Steps of a uniform size are preferable (with a riser of 190 mm and tread width of 280 mm) and a guard rail (as shown in Figure 3). Traction can be improved by painting the treads with anti-slip paint or applying adhesive strips to the edge of the steps.

![Rusted steel which is now a hazard.](image2)

![Well formed concrete steps with a guard rail.](image3)

Figure 2. Rusted steel which is now a hazard.  
Figure 3. Well formed concrete steps with a guard rail.

Hoses and taps

Store hoses tidily so that they do not form a trip hazard and align any connections so they are out of the way.
Hot water supply

Use safe taps or valves that cannot easily be opened by someone getting it caught in clothing or an inquisitive child. The best option is taps that require a two-step process to turn them on.

Transmission machinery

Transmission machinery is any which has a shaft, driving belt and pulley system, gearing, coupling, chain drives or device where motion is transmitted or received by an engine or motor. Dangerous parts in dairies include exposed v-belts and pulleys (such as vacuum pumps; milk lift pumps and water pumps). Where these exist you should:

- Fit a guard which totally encloses the transmission.
- Fit a barrier around the transmission so it is totally enclosed.
- On the vacuum pump, cut the spindle off flush (Figure 11).
- Fit a sleeve or cap - type guard (Figure 9).
1.2 Safe herringbone design

Most of the hazards are covered in the General section (above) with the most common injuries caused by slips or falls. However head injuries are also possible, especially with overhead pipes and rails.
1.3 Safe rotary design

The main issue in rotaries (in addition to those outlined in the General section above) is trapping hazards, particularly where the steel supports within the rotary pass fixed parts of the platform, particularly the exit and entry points, but also around the support structures for the platform and guard rails. The following are some guidelines from the Department of Labour for safe rotary design to prevent trapping points for people (for full document see http://www.osh.govt.nz/order/catalogue/rotarymilkingplatforms.shtml).

Safe clearance

- Up to 75cm above the platform height.
  The risk to people and animals can be minimised by ensuring there is a minimum clearance of 18cm between the bail divider rail or any attachment fitted on it, and the ring support rail or any fixed upright up to 75cm above the platform level.

- Between 75 and 80cm above platform height.
  A minimum safe clearance of 20cm should be used for height between 75-80cm above the platform level. This clearance will allow a person’s legs to pass through without trapping.

- Above 80cm from the platform.
  A safe clearance of 30 - 50cm may be necessary to ensure that a person’s body will not be trapped, however this may not be practical, as it could allow an animal to squeeze through. If this clearance is not practical, trip devices can be used (see Figure 13 for measurements).
Figure 13. The suggested clearance at different heights above the platform, between fixed points on the platform and fixed points on the external structure. Note also in this photo the clearance between the support structure in the background, and the platform.

Safety kick rails around the rotary, or along a herringbone, reduce the risk of getting kicked. Setting the rump rail support posts more than 600 mm from the edge of the platform removes the possibility of getting jammed between the two.

Figure 14. A rotary kick rail.

**Safety trip devices**

Safety trip devices can be fitted at potential trapping points at the fixed supporting pipe ring or upright at the ramp area, the ring pipe or bend or particularly at any entry/exit point to the platform. Trip devices ensure the platform stops immediately to prevent injury. A machine should not be able to restart automatically when the trip device is released back to its normal position, instead a restart button/process should be available.
Figure 15. An older style emergency stop mechanism on a platform to prevent animals being crushed. These are essential on any new rotary.

Figure 16. An overhead connection effectively links the ‘D’ gate to the safety trip device to stop the platform drive if a cow becomes jammed as she exits the platform.

**Safety cords**

A cord connected to a pull switch to stop the platform drive should go right around the platform.

Figure 17. Operating a safety cord.

**Shear pins**

Another safety option is the use of a moveable fitting or shear pin at points of potential trapping. This allows the pipe or ring to bend or support to be pushed away under a certain force to prevent trapping.
**Figure 18.** A spring controlled gate between the entry and exit bales to prevent trapping.

**Figure 19.** An alternative design for a ‘D’ gate will open slightly if a cow pushes it to enter the bail and will open fully if a cow becomes jammed as she exits the bail.

*Power control lockout device*

There needs to be a power control lockout switch to allow safe cleaning and maintenance. There also needs to be a clearly written procedure which employees are trained in and which has been acknowledged (signed) by employees. Machine start and stop buttons need to be clearly labelled and within easy reach.

*Figure 20.** Platform stop buttons should be placed in suitable positions for emergencies.

*Figure 21.** Machine start and stop buttons on the control console need to be clearly labelled.

*Safety Gates*

Safety gates will help to control access to the platform, particularly for children. However, even if one is in place vigilance is still required.
Figure 22. This gate is fitted with a child-proof catch like those commonly found around swimming pools.

Further Reading


- “Safe Guarding of Agricultural Machinery”. Farming Bulletin No.4, Department of Labour. www.dol.govt.nz

- Information about safety in rotary dairies.  
  http://osh.dol.govt.nz/order/catalogue/pdfs/farm014.pdf