

Adoption of new technologies

Automatic cup removers



Automation presents a viable alternative to improve labour efficiency and automatic cup removers (ACR) are one of the most popular options in Australia.

The correct removal of a cluster is important for preventing damage to the teat ends associated with over milking. ACR's remove the stress on both the operators and the cows by taking the guess work out of milking, through a consistent approach to cluster removal.

A recent survey found that almost 30 per cent of Australian farmers have installed ACR's (Tarrant & Armstrong 2012), and similar figures have been reported in New Zealand. Automatic cup removers offer the ability to significantly reduce labour requirements during milking, which after feed costs, can be the largest cost to a farm. This saving in labour comes about from the reduction in labour units needed by a typical dairy and achieving the operators task with ACR's. The technology is offered by a number of companies with varying degrees of integration with other technologies.

Mechanics of ACR

Automatic cup removers are made up of two components: milk flow sensors and milking cluster removers. Unlike some other technologies, ACRs can be retro-fitted to both new and pre-existing equipment which is a major advantage.

The ACR unit attaches to the milking cluster and measures the flow rate of the milk produced by the cow. Flow rate is monitored and once the level falls below the pre-set threshold the ACR unit is activated. Vacuum pressure is used during the milking process to hold the cups to the teat. When the ACR is activated, this vacuum is released causing the cluster to fall from the cow. The ACR then pulls the cluster out from under the cow, into a hanging position to await operator retrieval and attachment to the next cow.

Implications of ACR

Improvements in labour is the key benefit offered by ACR's, due to the absence of the cup removal task from the milking process.

▪ Labour efficiency

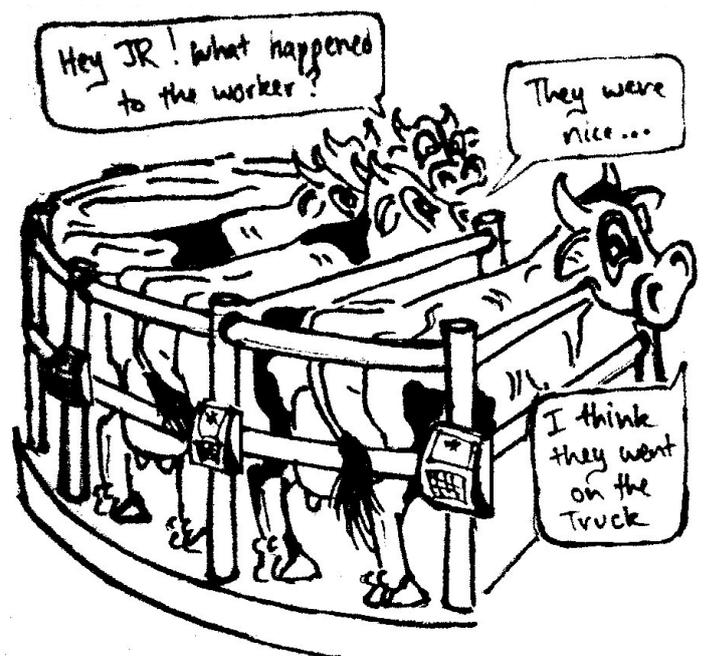
Recent studies have shown the reduction in required labour associated with ACR's makes the technology economically viable to Australian dairy farmers. However, the need to no longer remove cups has further benefits to operators as it can reduce the time spent in the dairy by lessening some of the workload and risks associated with milking.

▪ Consistency in approach

With the incorporation of ACR, milk quality or quantity is not affected.

▪ Adaptable

Automatic cup removers have been identified as one of the most popular forms of automation by dairy farmers. Their simplicity and effectiveness in addition to an ability to integrate within other systems ensures they return benefits to a large variety of dairy systems.

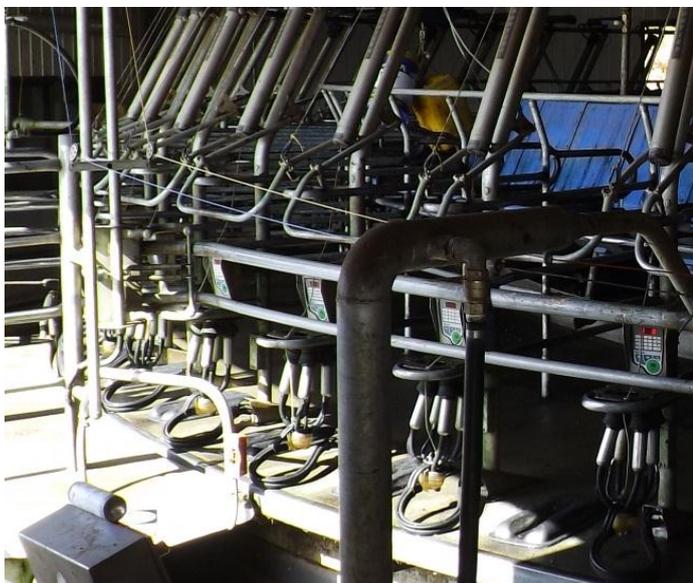
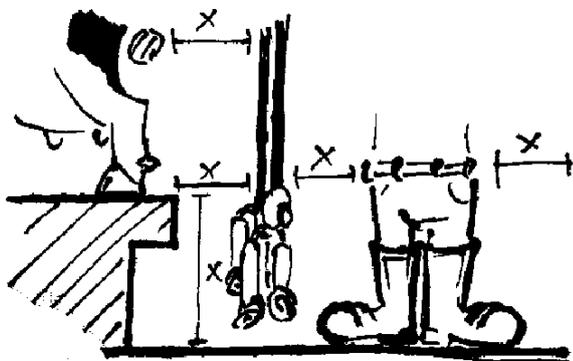


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Installation of ACR

New or existing milking sheds can benefit from the installation of ACR's. However, there are some important aspects to consider to ensure their success. The operation of cup removers means there will be times when clusters are falling or swinging which creates a potential OH&S risk if appropriate space is not available in the pit or around the milking platform for operators to maintain a safe distance. This is compounded by the increase in clutter associated with more equipment in the pit.

The uncontrolled movement associated with ACR's present a risk to operators and so it is important to consider space and distances within the pit. The diagram below details some distances (shown by X) which are important to consider.



Economics of ACR

A 2010 DEPI study examining the economics of ACR explored the in depth return on investment of the technology (Tarrant 2010). The key driver for investment viability was the ability to offset labour. In situations where the use of ACR did not create significant improvements in labour efficiency the investment was far less viable.

The following is a simple approach to examining the economics of ACR's for a farm operation. A quick examination of the cost return of ACR's in an example with 24 clusters.

Total cost of ACR - \$ 41,000

Assumed it takes one person **one hour** of the milking routine to perform cup removal, and they are paid \$ 24.00 an hour.

$(1 \times 2 \text{ (milking a day)}) \times 24 = \$ 48.00 \text{ per day}$

$41,000 / 48 = 855 \text{ days} = 2.4 \text{ years to pay off.}$

plus maintenance costs

From these calculations ACR's can be considered a short to medium term investment. Further economics should be performed before purchasing the technology to ensure success within your system.

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