LEARNING FROM OTHERS

Perhaps the richest source of information is the experience of others – information about milk harvesting is no different.

A recent survey of Australian dairy farmers has given an interesting insight into the milk harvesting performance of the Australian dairy industry. This survey also identified some farmers with outstanding results from all regions in Australia – many were visited and monitored over an extended period.

Examining how others go about their milk harvesting can help to:

- determine reasonable performance limits;
- identify areas that could benefit from change; and
- avoid problems when designing a new system.

This chapter reports on current industry performance and uses examples of excellence in milk harvesting productivity from around the country.

- **Industry performance graphs** p132

  Reading the graphs, types of graphs.

  Graph 1: Cows/operator/hour (cups on cups off).

  Graph 2: Litres/operator/hour (cups on cups off).

  Graph 3: Cow speed (paddock to yard).

  Graph 4: Machine cleaning (minutes of labour).

  Graph 5: Yard cleaning time (minutes of labour).

  Graph 6: Clusters/operator.

  Graph 7: Cows/cluster/hour.

  Graph 8: Litres/operator/hour (Total Milk Harvesting Time).

- **Case study farms** p138

  Double up dairies.

  Swingover dairies.

  Rotary dairies.

This chapter provides a good way to see how others in the industry operate – without leaving the farm.

Industry performance graphs

A postal survey of Australian dairy farmers conducted around Australia between 1998-2000 gave an interesting insight into the milk harvesting performance of the Australian dairy industry. The data from more than 1000 farms has been collated and is presented in a series of industry performance graphs. These graphs give a unique snapshot of the industry and will be used to monitor the change in the industry as a whole into the future.

The industry performance graphs can also be used to benchmark the productivity of individuals.

These graphs represent only a sample of the farms that exist in Australia. Some of the case study farms were not a part of the survey population and were identified by other means. This does not diminish the usefulness of the graphs, but this should be kept in mind – no doubt there are performances out in the industry that are better and worse than those represented here.

Reading the graphs

Each graph shows an individual milk harvesting performance measure (see Figure 7.1).

- The type of dairy is listed up the side – the vertical axis. The value of the performance measure is on the bottom – the horizontal axis.
- The spread of results from the survey is depicted by the length of the line – read these values from the horizontal axis.

  In the example Figure 7.1, the horizontal axis shows that, for the rotary dairies surveyed, the number of cows an operator put through per hour ranged from about 30 to around 185.
- The 50% mark indicates the value of the middle farm in the sample.

  For example, half of the sample was below this mark and half above it.
- The 75% mark to the end of the line represents the top 25% of farms surveyed.

  For example, to the right of this mark are farms performing in the top 25%.
- The case study icon indicates the value achieved by the highest case study farm monitored.

  For example in Figure 7.1, note that the highest rotary case study farm was performing well above the top of the sample surveyed in terms of cows per operator per hour.

In some industry performance graphs, the highest values found in the survey are not necessarily the best. Higher figures in Graphs 3, 4 and 5 indicate substantial room for improvement.

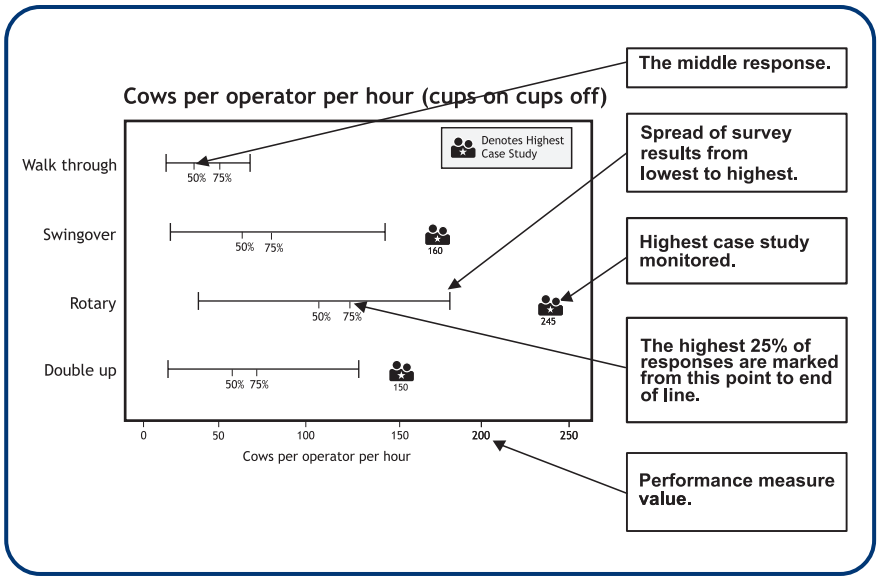


Figure 7.1: Important features of the industry performance graphs.
Source: National Milk Harvesting Centre.

These industry performance graphs include farmers from all over Australia. For that reason, they do have limitations – unique features which impact on productivity in a particular area are lost – averaged out by hundreds of other farms in different geographic locations.

A good example is the constraints that farmers in northern Queensland face as they bring their cows from the paddock to the dairy. In this area it is too wet to use conventional laneways, so farmers use narrow concrete walkways to ferry their cows along. This impacts greatly on cow walking speed.

Types of graphs

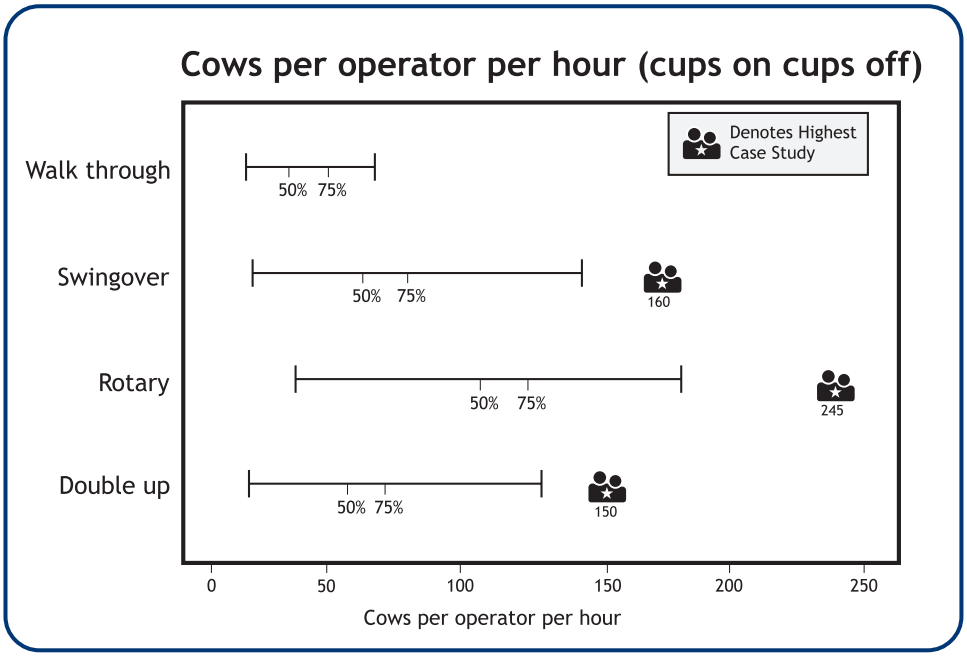
A series of industry performance graphs are included on the following pages and have been compiled using the survey information. The graphs included relate to the following performance measures:

1. Cows per operator per hour (cups on cups off).
2. Litres per operator per hour (cups on cups off).
3. Cow speed (paddock to yard).
4. Milking machine cleaning (minutes of labour).
5. Yard cleaning time (minutes of labour).
6. Clusters per operator.
7. Cows per cluster per hour.
8. Litres per operator per hour (Total Milk Harvesting Time).

Performance measures, p19.

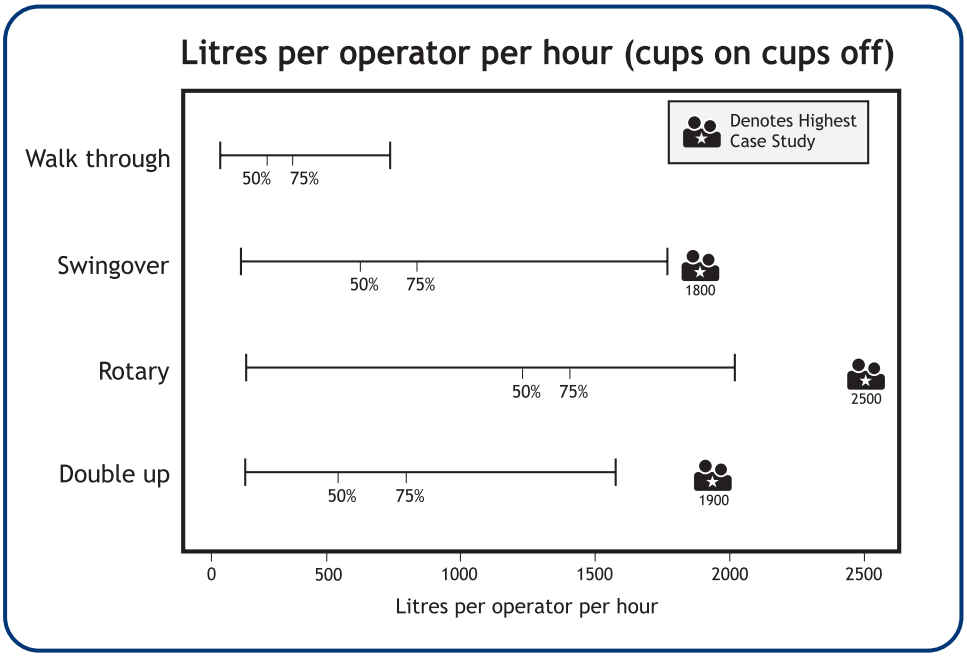
Graph 1: Cows per operator per hour (cups on cups off).

This graph focuses on the number of cows a milker can milk in an hour from when the first cluster is attached until the last one is removed.



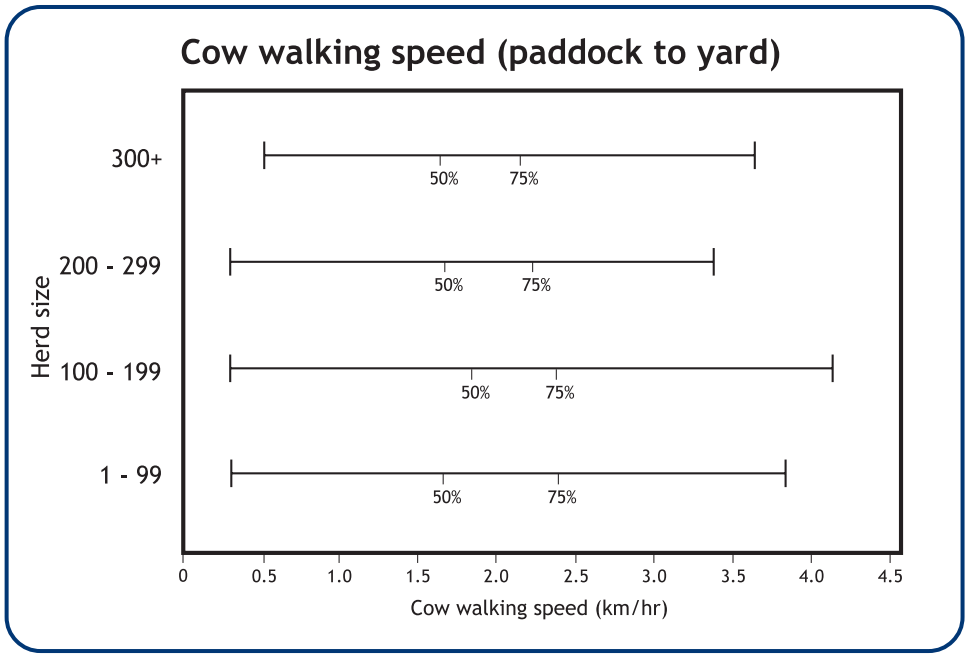
Graph 2: Litres per operator per hour (cups on cups off).

The productivity of the labour used in the dairy in terms of litres of milk harvested is shown in this graph.



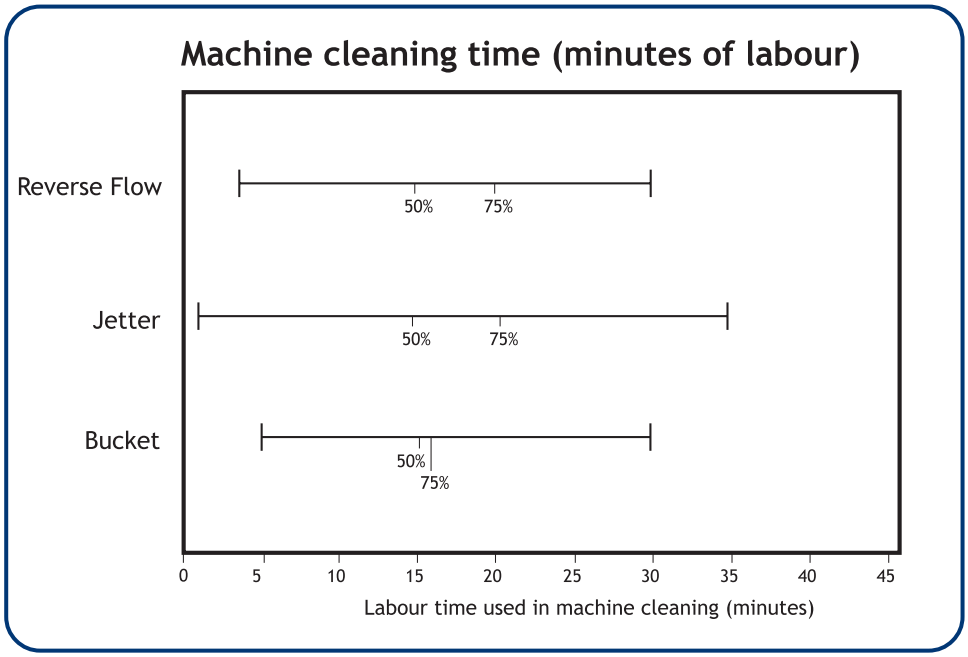
Graph 3: Cow walking speed (paddock to yard).

This graph shows the time it takes to bring cows up to the dairy. Normally labour is required for collecting the cows from the paddock and bringing them to the yard.



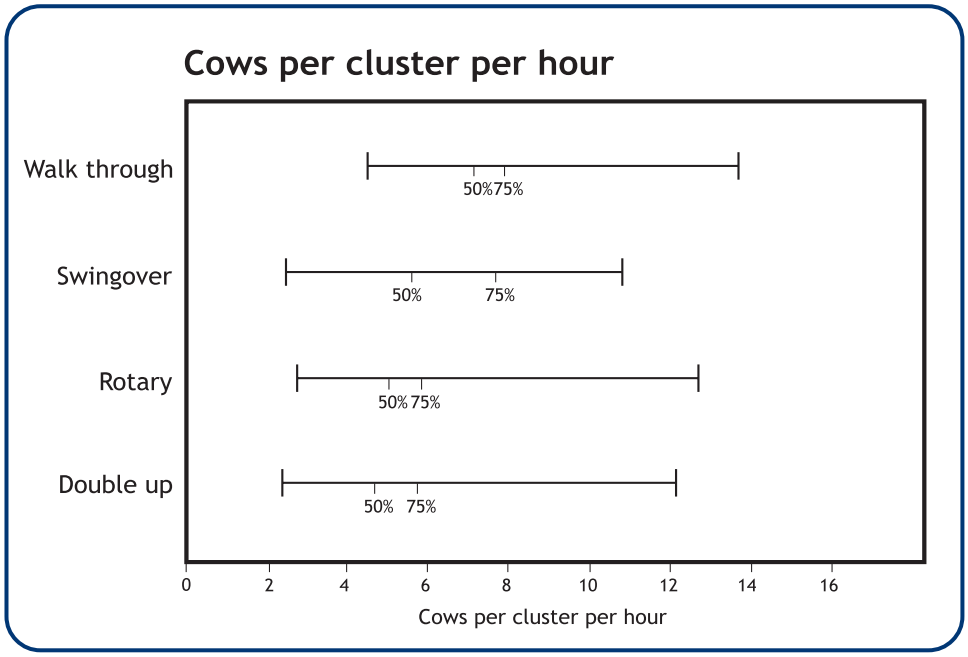
Graph 4: Machine cleaning time (minutes of labour).

This performance measurement is used to gauge the labour time spent on machine cleaning.



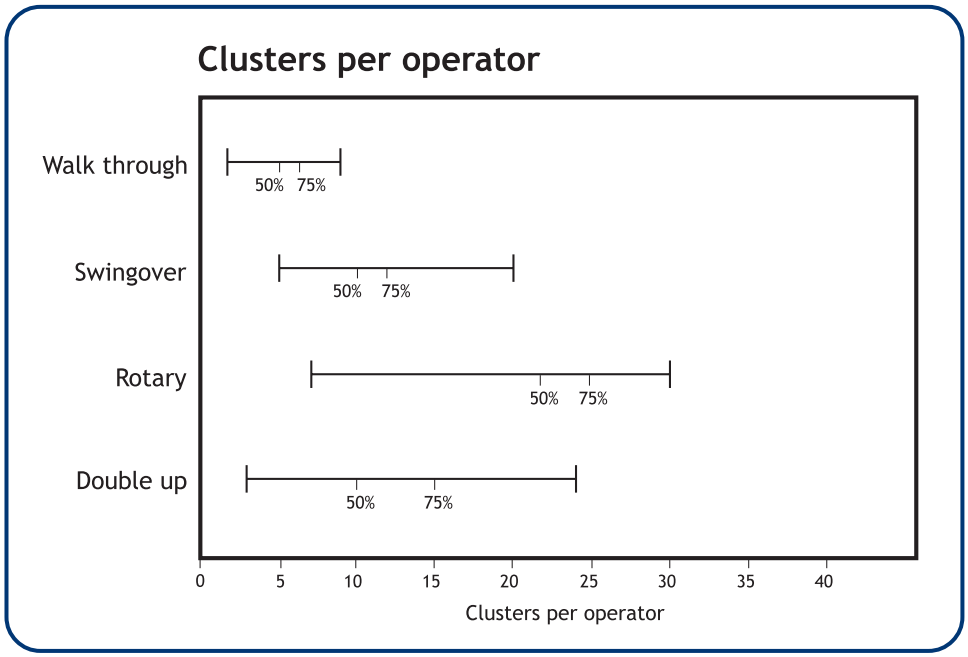
Graph 5: Yard cleaning time (minutes of labour).

This performance measurement is used to gauge the labour time spent on yard cleaning.



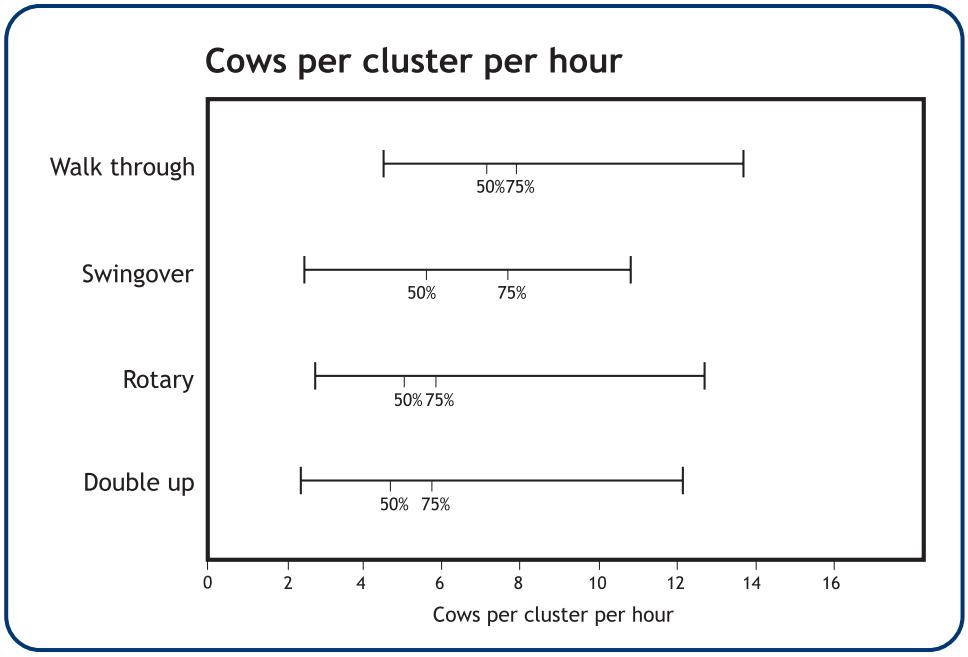
Graph 6: Clusters per operator.

This graph gives some idea of how many clusters milkers are handling across the industry. Care needs to be taken if comparing your own clusters per operator performance with the wider industry when using this graph.



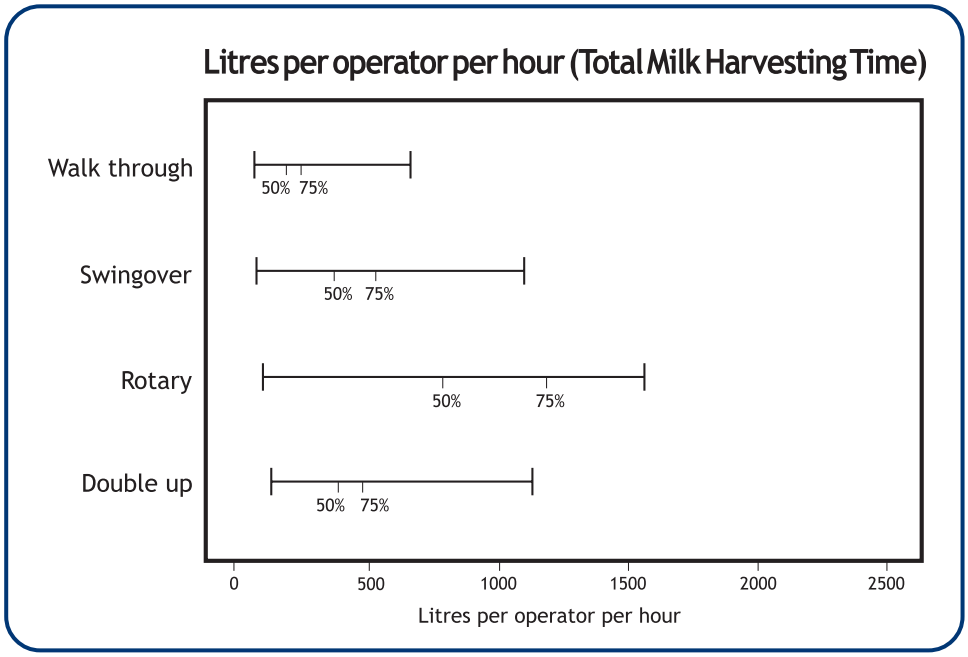
Graph 7: Cows per cluster per hour.

This performance measure examines how many cows are milked by an individual cluster in each hour of milking.



Graph 8: Litres per operator per hour (Total Milk Harvesting Time).

This graph shows the overall performance of the milk harvesting system. The total milk harvesting time is from when the cows leave the paddock on their way to the dairy until after clean up.



Case study farms

Following the postal survey, a number of the farms with excellent productivity were visited to see how they achieved their performance. These farms were watched during milking and their managers interviewed. Data was collected first hand and monitors were placed in the dairy to collect information on milking productivity over 10 days. The case study farm reports that appear in these guidelines are the result of this work.

These case study farms are examples of milk harvesting systems that perform better than 75% of the industry in terms of cows milked per operator per hour (cows/operator/hour) or in terms of litres of milk harvested per operator per hour (litres/operator/hour).

Fourteen case studies are provided to highlight what some farms have done to be efficient and highly productive in their milk harvesting. Each case study is a brief snapshot of these operations, highlighting elements that make their system efficient for them.

In each case graphs of cows/operator/hour (cup on cups off) and litres/operator/hour (cup on cups off) are presented. These illustrate their productivity in the context of the wider industry. The red dot on each graph illustrates the individual performance for each individual case study.

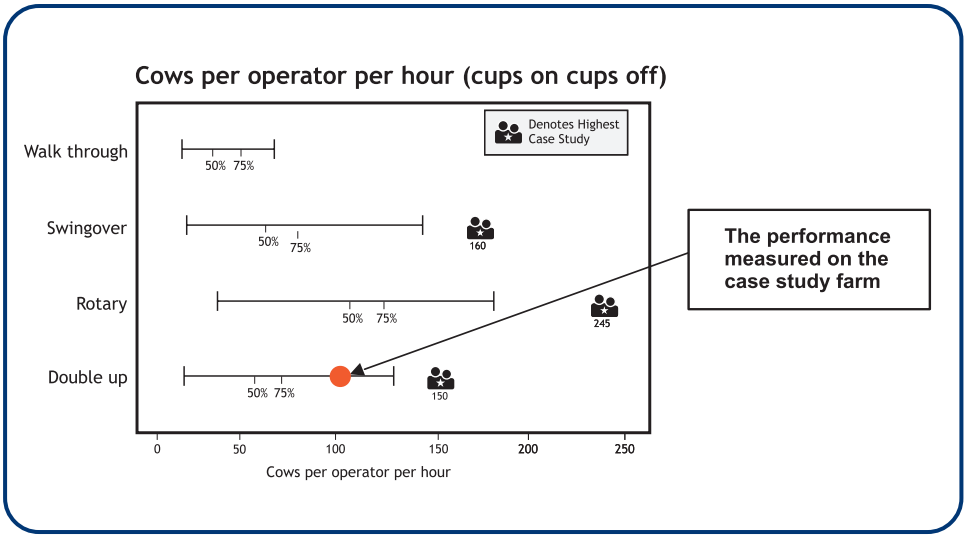


Figure 7.2: Graph showing performance of case study farm.

Source: National Milk Harvesting Centre.

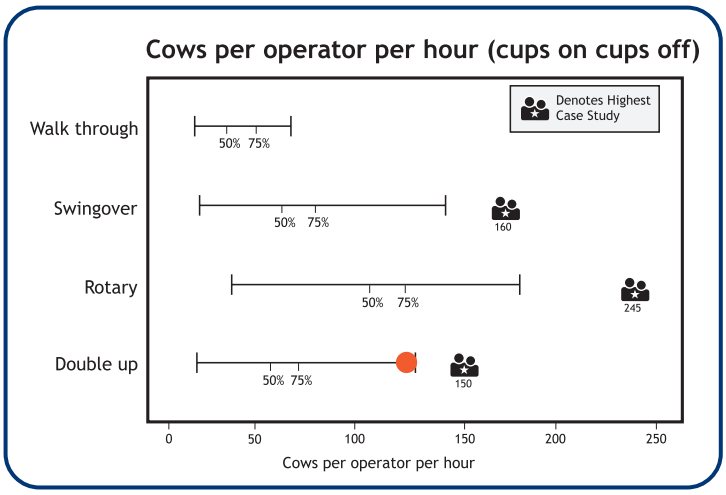
Double up Case Study 1

Tom and Stephanie, New South Wales

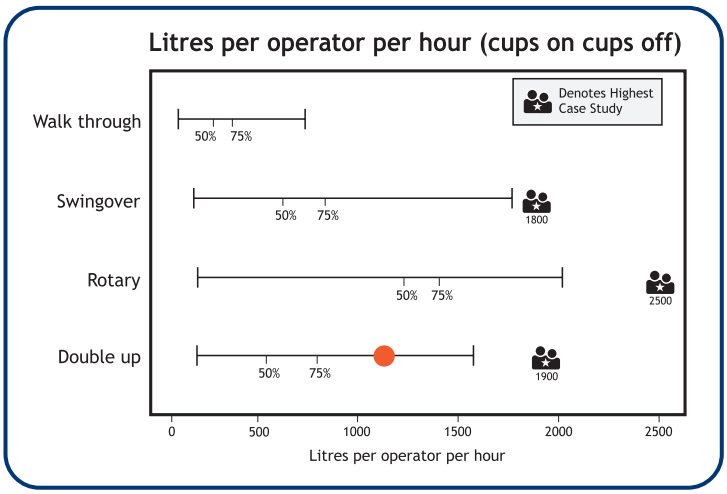
DOUBLE UP DAIRY WITH 28 CLUSTERS, MILKING 200 COWS AT PEAK

Tom and Stephanie operate their dairy farm in New South Wales. Their double up dairy operates in the top 25% of such dairies in terms of cows per operator per hour and litres per operator per hour. The milking shed was remodelled in 1997 to a 14 a side double dairy with automatic cluster removers. The dairy was designed so that one operator could comfortably milk 250-300 cows in a reasonable amount of time.

Tom and Stephanie's current herd is milked year round, with 200 being the maximum milked at one time. Observation of this dairy in operation showed the operator milking about 124 cows an hour and harvesting about 1143 litres of milk an hour. Looking at the industry performance graphs, we see that these numbers put Tom and Stephanie's operation in the top 25% of double up dairies.



The cows per operator per hour graph shows Tom and Stephanie's result of 124 is within the top 25% of the industry.



The litres per operator per hour graph shows Tom and Stephanie's result of 1143 is within the top 25% of the industry.

PERFORMANCE

Tom and Stephanie's milk harvesting performance is due to:

- ✓ a well-planned dairy and yard area
- ✓ a dairy designed for one operator with 28 clusters
- ✓ good stockhandling skills

Factors that make Tom and Stephanie's system productive:

Dairy and yard area

Cows enter yard at the rear – this reduces milling of the cows when sorting their social order.
Result: cows move into the yard faster and are ready to move into the dairy more quickly.

Dairy roof extends over the yard for a few metres.
Result: in warm weather, this shade draws the cows close to the dairy entrance and assists cow-flow onto the platform.

Cows can enter the dairy straight from the yard, helping to reduce cow entry time.

The dairy design

Exit and entry gates can be operated from anywhere in the pit.
Result: it reduces the walking required of the milker.

Use of automatic cluster removers.
Result: reduces the work routine tasks the milker must complete.
Result: reduces the time required for a milker to make a decision on cluster removal.
Result: dramatically reduces the stress on the milker, as all cows are milked out the same, even if the milker is required to deal with something else at the time. For example, the milker started to feed calves while the last side milked out.

Drafting can be operated from the pit.
Result: reduces the time the operator is distracted from the milking task.

Locking head bails to make cows more settled during milking.
Result: cows do not have to compete for their feed or be pushed around by larger or more dominate cows.
Result: better cow entry times and improved milk let-down, plus faster milk out times.

The head bails in the dairy reduce cow aggression.

Work routine of 26 seconds per cow

The work routine time allows milkers to do tasks carefully.
Result: a maximum of 138 cows can be handled by a milker each hour.

Good stockhandling skills

Cow-friendly operators – do not shout at or hit the cows.
Result: makes cows more comfortable about entering the dairy and being milked.
Result: leads to reduced cow entry times, improves milk let-down and milk out times.

Double up Case Study 2

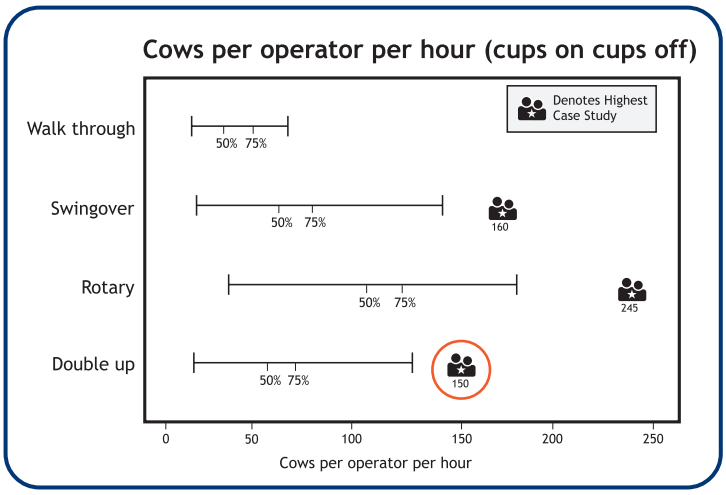
Chris and Jan, Victoria

DOUBLE UP RAPID EXIT DAIRY WITH 32 CLUSTERS

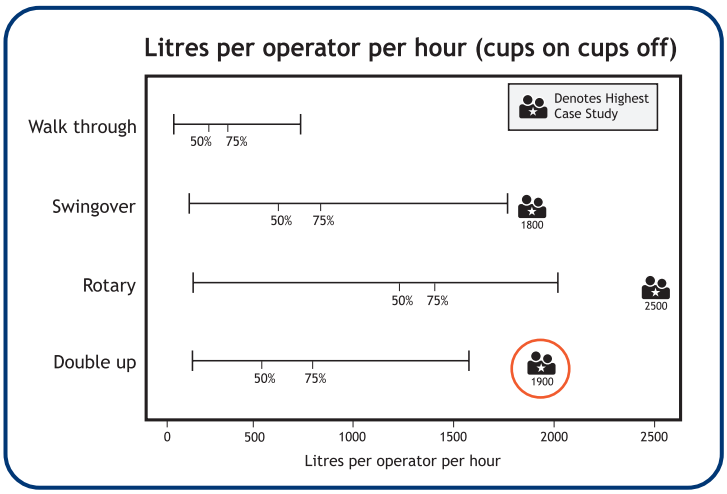
Chris and Jan built this dairy specifically so that either one of them could comfortably milk in it alone. They also believe that, for it to be comfortable for the milker, the cows must also be comfortable. The dairy is fitted with automatic cluster removers and stall gates and was constructed on a green field site in 1999.

Chris normally milks somewhere between 140 and 160 cows an hour. At the tail end of the season, he was observed to milk at a rate of 215 cows an hour. For that milking, his work routine per cow was in the order of 17 seconds. This was done without sacrificing milk quality. Chris still teat sprays using a hand-held spray unit.

Chris's normal productivity is well above the surveyed farms.



The cows per operator per hour graph shows Chris and Jan's result of 150 is the top performance measured of any double up case study.



The litres per operator per hour graph shows Chris and Jan's result of 1900 is the top performance measured of any double up case study.

PERFORMANCE

Chris and Jan's milk harvesting performance is due to:

- ✓ good dairy design
- ✓ effective stockhandling skills
- ✓ the use of automation

Factors that make Chris and Jan's system productive:

■ Dairy design

The dairy is high, wide, bright and has good airflow.
Result: cow entry is encouraged.

Entry into the dairy is straight off the rectangular yard, with no ramps or steps to be climbed.
Result: rapid cow movement into the dairy.

Stall gates provide a secure, uncontested space for cows while being milked.
Result: cow entry is rapid and less stressful for the milker.

■ Automation

Rapid exit

The feeders and breast rails rise, allowing the cows to walk out forward. Once the cows have moved forward, the feeders can be lowered again and the next run can enter the dairy.
Result: cow exit times of less than 1½ seconds per cow, reducing the milker's work routine time.

Cluster removers

Cluster removers provide a consistent finish to the milking of all cows. They free the milker from the task of removing the clusters and from having to check some cows a number of times to see if they are milked out.
Result: reduced tasks for the milker and reduced work routine time.

Automated feeders

Grain is automatically placed in the feeders when they are raised for cow exit.
Result: one less task for the milker.

■ Efficient work routine

Chris operates a smooth, well thought out work routine, with little wasted movement. He walks from one end of the dairy to the other spraying teats with a hand-held sprayer, after all the clusters have been taken off by the auto cluster removers. At the far end, he activates the rapid exit mechanism. By the time he has walked back to the other end of the dairy the cows have exited and he can lower the mechanism and let the next batch in.
Result: short work routine required for each cow.

■ Stockhandling skills

Chris and Jan took great care to train their cows to enter the dairy on their own. They did not give the cows the stimulus of someone leaving the pit to chase them in. They do not use a backing gate. During the training period (3 months), if the milker needed to move the cows up closer to the dairy, the milker would leave the dairy and come around from the back of the yard to move the cows up.
Result: cows now enter the dairy willingly, without an operator leaving the pit.

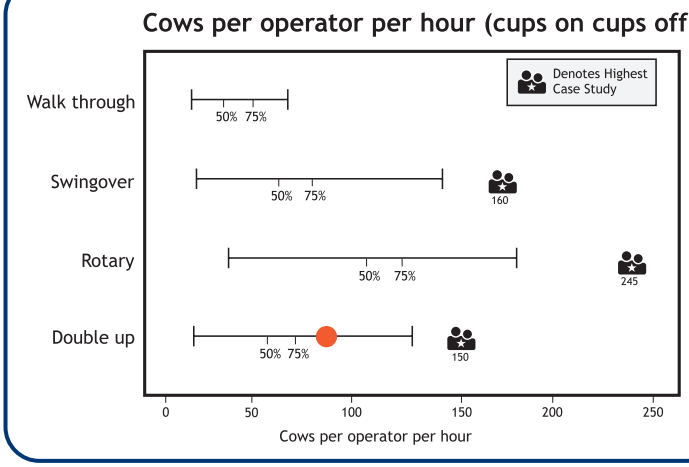
This view of Chris and Jan's dairy is looking down on the cows towards the cow entry end.

Double up Case Study 3

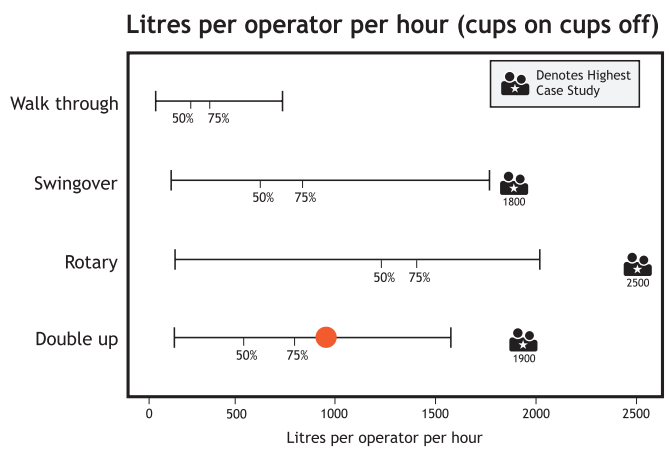
Mark, Western Australia

DOUBLE UP DAIRY WITH 16 CLUSTERS

Mark's milk harvesting operation came out of the West Australian survey as operating in the upper 25% of the sample. Mark operates an 8 a side double up dairy milking a Friesian herd. His dairy is interesting, as it is a high line double up dairy. His figures of about 90 cows an hour and 956 litres an hour put him in the top 25% of double up dairies nation-wide.



The cows per operator per hour graph shows Mark's result of 90 is within the top 25% of the industry.



The litres per operator per hour graph shows Mark's result of 956 is within the top 25% of the industry.

PERFORMANCE

Mark's milk harvesting performance is due to:

- ✓ good cow-flow
- ✓ rapid milk out of cows

Factors that make Mark's system productive:

■ Cow-flow

Cows are held in a rectangular yard that leads straight into the milking dairy.
Result: no restrictions to cow entry.

Grain is fed in the dairy.
Result: increased motivation for cows to enter dairy.

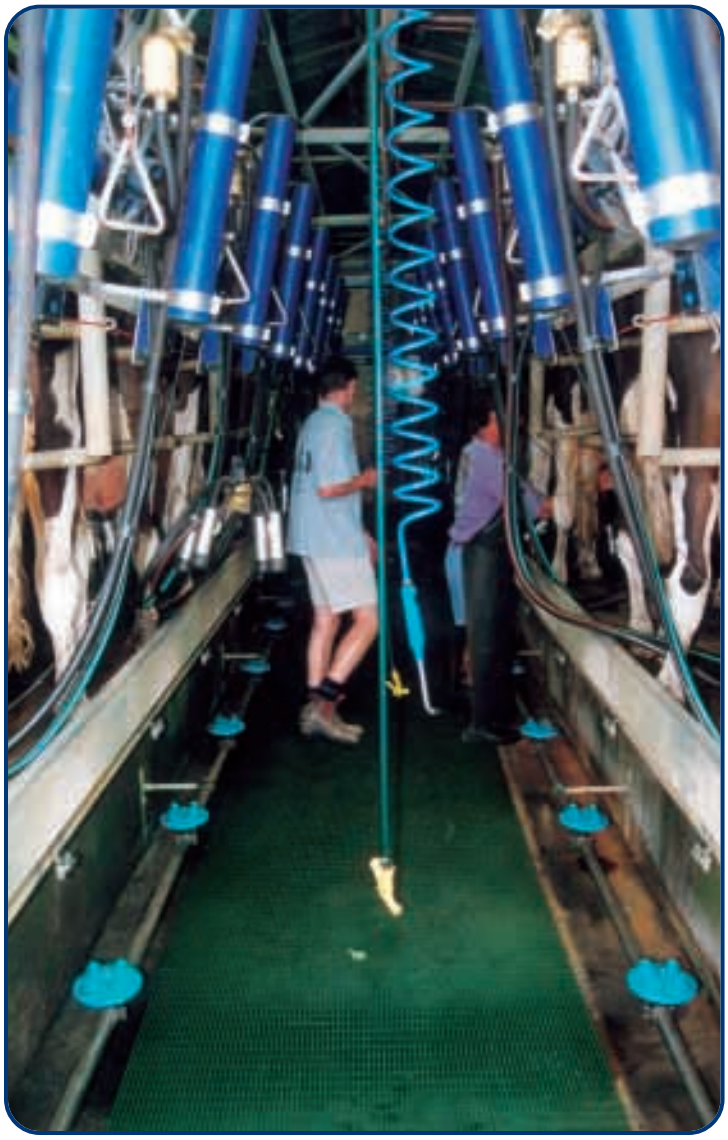
■ Rapid milk out

Mark operates a quiet, regular routine in his dairy. Cows are comfortable being milked in his operation, which promotes good milk let-down. Mark also operates a quiet, low-stress milking environment.
Result: shorter milk out times, with higher milk flow rates.

■ Cluster removers

Automatic cluster removers mean that all the cows are milked out consistently. The milker does not need to check a cow a couple of times to see if she is milked out.
Result: operator's time is freed up to attend to other tasks in the pit.
Result: less stress on the operator during milking.

Note: Automatic cluster removers are useful tools in milk harvesting. Where a milker has more tasks than he/she can handle, the addition of cluster removers can significantly increase productivity. If the addition of cluster removers means the reduction of labour then labour efficiency is improved. If the addition of cluster removers only adds to the idle time of the milker, then there will be no gain in labour productivity.



This photo shows a view of Mark's pit with a visitor during milking time.

Double up Case Study 4

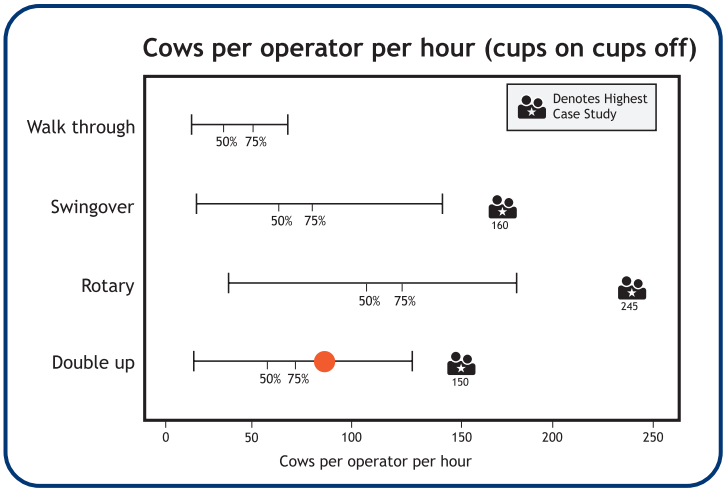
Phillip, Karen and Jason, Tasmania

DOUBLE UP DAIRY WITH 36 CLUSTERS

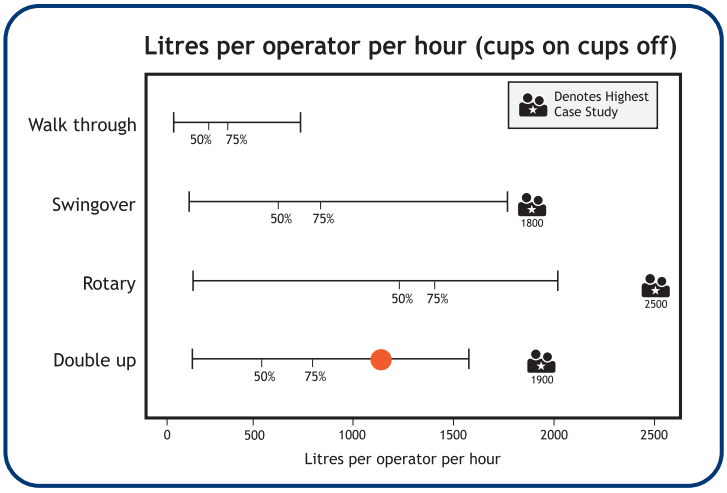
Phillip and Karen, with son Jason, share farm a 340-cow herd in Tasmania. Several years ago, the dairy was upgraded from a 10 a side double up to the current configuration of 18 a side without cluster removers. This dairy is run with two milkers.

The renovation was restricted, as renovations often are. They were able to modify the yard to improve cow entry.

They were identified from the Tasmanian data as operating in the top 25% of the sample for double up dairies. Their milk harvesting process was measured at 88 cows/operator/hour and 1125 litres/operator/hour. Their figures are shown on the following graphs from the national survey.



The cows per operator per hour graph shows that Phillip, Karen and Jason's result of 88 is within the top 25% of the industry.



The litres per operator per hour graph shows Phillip, Karen and Jason's result of 1125 is within the top 25% of the industry.

PERFORMANCE

Phillip, Karen and Jason's milk harvesting performance is due to:

- ✓ good stockhandling skills
- ✓ a large number of clusters

Factors that make Phillip, Karen and Jason's system productive:

■ Stockhandling skills

Philip often walks in with the cows and can scratch many of the cows behind the ears while they are standing in the paddock.

Result: calm cows with good milk let-down.

Careful attention to the health of the herd, keeping mastitis low.

Result: less interruption to normal milking procedures

Milking routine is always quiet and consistent.

Result: good cow entry and rapid milk out due to good milk let-down.

■ Slow milking cows

These are clearly marked. Clusters are put on these cows first. The milker then massages the udder for 15 or 20 seconds, to help stimulate milk flow.

Result: more even batch milk out times.

■ Cow-flow

With the renovated yard and dairy entry, the cows are able to enter straight into the dairy coming up a gentle rise in the yard.

Result: smooth flow of cows into the dairy, reducing operator wait time.

Yard washing

■ Dribble bar

Water from the plate cooler drains through a dribble bar at the entry to the dairy to keep the concrete wet.

Result: faster concrete cleaning at the end of milking and less cow slip, according to Phillip.

■ Tipping drums

To assist in keeping the total yard wet, Phillip has installed tipping drums around the outside of the yard. These drums gradually fill with water to a certain level and then automatically dump onto the yard. This periodic wetting keeps the yard surface wet.

Result: hosing down at the end of milking is quick and relatively easy.

This photo shows the dribble bar at the entrance to the dairy before any cows have entered the dairy.

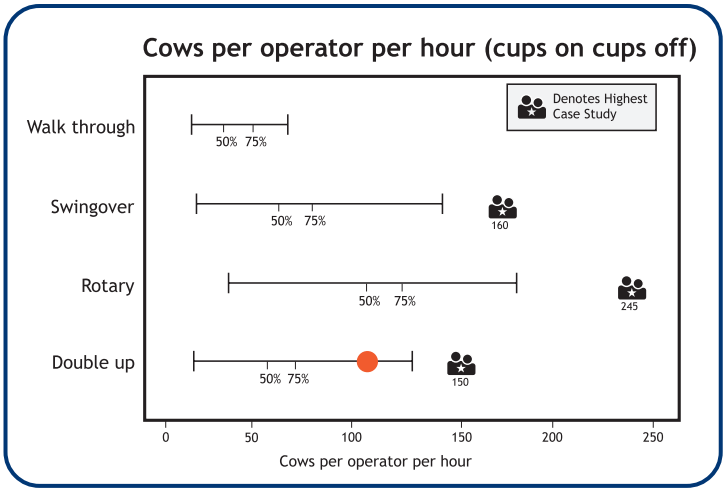
Double up Case Study 5

Phil and Shannon, South Australia

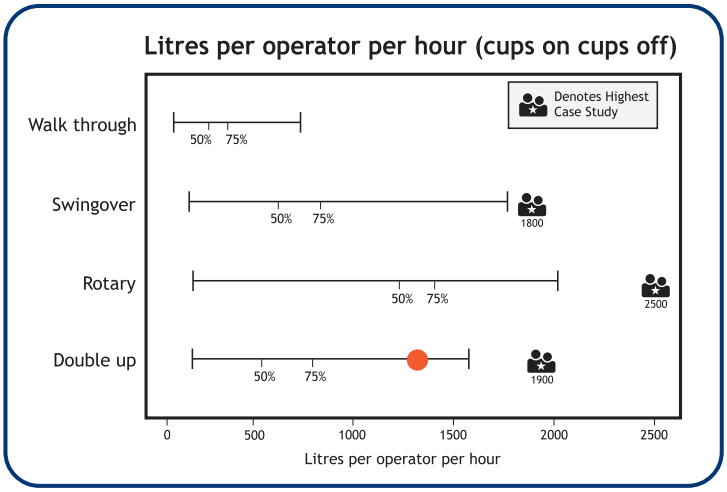
DOUBLE UP DAIRY WITH 20 CLUSTERS, MILKING 165 COWS

Phil and his son, Shannon, farm south of Adelaide. Their herd is currently growing from 165 cows to an eventual goal of a 300-cow herd.

The milking dairy was built in 1996 using the old plant and vat rooms. The old system was a small, dark double up dairy. The current system was chosen to improve cow-flow, as they could only milk about 55 cows an hour in the old dairy. They went for a 10 a side double up. Phil and Shannon want a dairy that one milker can operate comfortably when the herd gets to its final size.



The cows per operator per hour graph shows Phil and Shannon's result of 110 is within the top 25% of the industry.



The litres per operator per hour graph shows Phil and Shannon's result of 1400 is within the top 25% of the industry.

PERFORMANCE

Phillip and Shannon's milk harvesting performance is due to:

- ✓ good cow-flow
- ✓ good stockhandling skills

Factors that make Phillip and Shannon's system productive:

■ Good cow-flow

The entrance into the dairy is straight in from the yard. The dairy is bright and open, with no walls on the sides of the dairy.

Result: smooth cow entry, reducing milker wait time.

■ Use of stall gates

This provides cows with their own space on the milking platform. On exit, as the stall gates rise, a grate covers over the feed trough and prevents access to grain as the cows exit.

Result: good cow entry and exit times.

■ Stockhandling skills

Cows have been trained to not need the stimulus of a milker leaving the pit to enter the dairy. They do not use a backing gate. The milkers are quiet and calm in the dairy.

Result: cows are comfortable to enter the dairy and have good milk let-down.

■ Milk production

Their cows produce around 25 litres of milk at peak production. This, combined with good cow-flow, means the clusters are busy more of the time extracting milk.

Result: a good yield of milk per operator per hour. In terms of labour productivity, it is better to milk cows that are giving more milk rather than less.

■ Use of a separate dump line

They use a dump line instead of test buckets for any milk that cannot go into the vat.

Result: saved time.

Result: less lifting and carrying for milkers.

This photo shows one side of the cow platform.

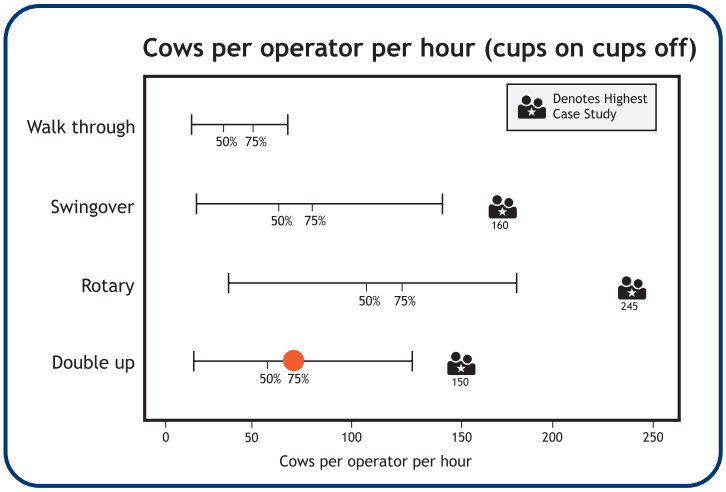
Double up Case Study 6

Bob and Jim, Queensland

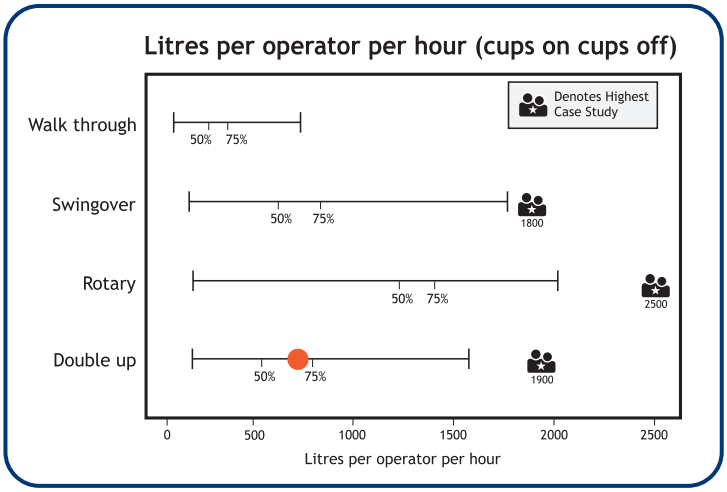
DOUBLE UP DAIRY WITH 26 CLUSTERS, MILKING 133 COWS

Bob and Jim farm in Queensland. The original dairy was set up in 1988 with 12 clusters on a side. This has been upgraded by adding another cluster on each side, increasing the milkline to 3 inches and doubling the air-flow capacity of the vacuum pump. They operate their dairy with two milkers (themselves).

At their peak of production, they milk 66 cows per operator per hour and harvest 684 litres of milk per operator an hour. This puts their milk harvesting operation at the top 25% of double up dairies for this dairy type in Queensland and very near to it on the national graphs. This is shown on the following graphs.



The cows per operator per hour graph shows Bob and Jim's result of 66 is within the top 25% of the industry.



The litres per operator per hour graph shows Bob and Jim's result of 684 is just outside the top 25% of the industry.

PERFORMANCE

Bob and Jim's milk harvesting performance is due to:

- ✓ having two operators in the pit
- ✓ good cow-flow

Factors that make Bob and Jim's milk harvesting system productive:

■ Two milkers in the pit

With two milkers in the dairy, clusters are not idle any longer than necessary. Milkers are able to attach and remove the clusters in a timely manner.

Result: clusters are as busy as possible in this double up dairy.

Result: reduced over milking improves cluster use and helps improve udder health.

■ Cow-flow

Cows have a straight entry into the dairy from the yard, with no ramp or steps to walk over. The dairy has walls on one side and one end only, so the dairy is bright and open. There are no dark shadows for the cows to walk through.

Result: cow movement into the dairy is rapid reducing idle time for the clusters and milkers.

■ Stockhandling skills

Bob and Jim work quietly and calmly in the pit, with a consistent milking routine each milking. Cows do not like loud noises and shouting.

Result: comfortable cows enter the dairy willingly and have good milk let-down.

■ Hose gantry

The gantry supports a lot of the weight of the long hose used for yard washing. This means that the hose does not get caught up on corners so easily and is easier to drag around in the yard.

Result: less wear and tear on the milker.

Above:
This photo shows the hose support in Bob and Jim's yard above the backing gate.

Left:
This photo shows the inside view of the dairy.

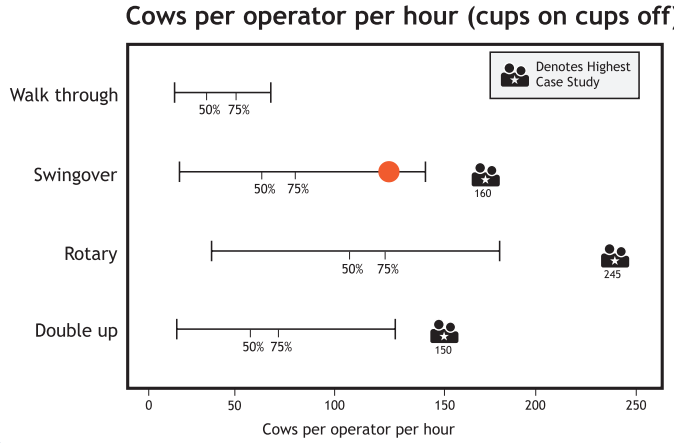
Swingover Case Study 1

Red and David, Queensland

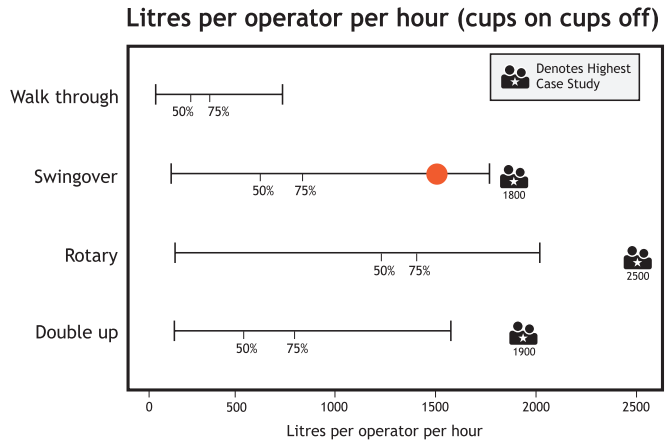
SWINGOVER DAIRY WITH 12 CLUSTERS, MILKING 180 COWS AT PEAK

Red and his son, David, farm in Queensland. Their dairy was built about five years ago. Their aim at the time the dairy was built was to have improved cow-flow, more efficient use of clusters and a dairy where both the cows and the milker were happy.

Their milk harvesting system was identified as being in the top 25% of swingover dairies, as shown by the following graphs from the national survey.



The cows per operator per hour graph shows Red and David's result of 120 is within the top 25% of the industry.



The litres per operator per hour graph shows Red and David's result of 1500 is within the top 25% of the industry.

PERFORMANCE

Red and David's milk harvesting performance is due to:

- ✓ good dairy design
- ✓ good stockhandling skills
- ✓ good milk out times

Factors that make Red and David's system productive:

Dairy design

■ Bright and open dairy

Cows do not like to cross dark shadows. Open dairies provide light spaces to move into and also provide more comfort in terms of air flow.

Result: cows enter the dairy more willingly.

■ Stall gates

These make cows more comfortable and the first cow in does not get crushed against the exit gate. Cows do not need to compete for feed in the dairy. Larger or more dominant cows do not crush smaller cows.

Result: cows enter the dairy more willingly, reducing the milker's idle time.

■ Automatic operation of feeders

When the exit gate is closed, it activates a switch on the feeding system and no operator intervention is required.

Result: one less task for the milker to perform.

■ Straight entry into dairy

There is no need for the cows to turn when entering the dairy. The yard and the milking platform are at the same level, so no ramp or steps are present.

Result: good cow entry.

■ Stockhandling skills

The milking routine is quiet and consistent at each milking. Red and David take care not to excite the cows or create a stressful environment for them.

Result: contented cows entering well, with good milk let-down.

■ Quick milk out of cows

Each teat is brushed with a gloved hand before the clusters are attached. This allows the milker to check for hard quarters. It also results in even let-down of milk and promotes higher milk-flow rates. This was picked up from the Countdown Downunder program.

Result: Red and David are happy with the improved milking times.

Result: less time to milk out the cows, even with the extra teat handling.

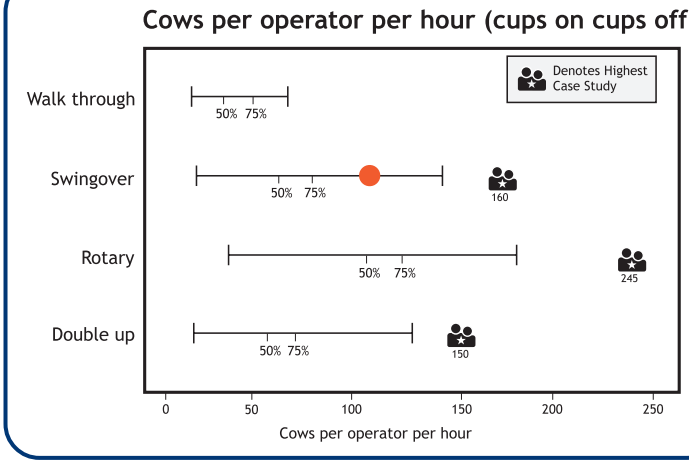
This photo shows an outside view of Red and David's dairy.

Swingover Case Study 2

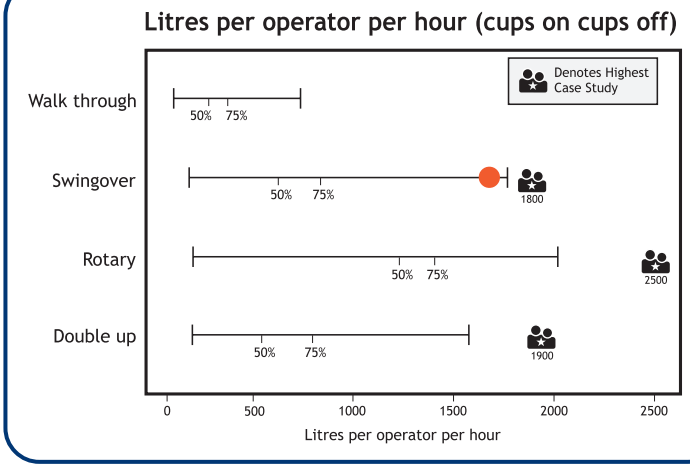
Cyril and Leslie, Western Australia

SWINGOVER DAIRY WITH 15 CLUSTERS

Cyril and Leslie own and operate the farm with one employee. This is a modern dairy, developed on a green field site. Their milk harvesting system is comfortable for both the milker and the cow. This farm came out of the Western Australia survey as being in the top 25% of performers, both in terms of cows per operator per hour, and litres of milk per operator per hour. The figures for their operation are 105 cows per operator per hour, with milk flow around 1605 litres per operator per hour.



The cows per operator per hour graph shows Cyril and Leslie's result of 105 is within the top 25% of the industry.



The litres per operator per hour graph shows Cyril and Leslie's result of 1605 is within the top 25% of the industry.

PERFORMANCE

Cyril and Leslie's milk harvesting performance is due to:

- ✓ good dairy design
- ✓ effective stockhandling skills

Factors that make Cyril and Leslie's system productive:

■ Cow entry

Entry is straight from the yard, with no turns or steps or ramps.
There is a panel out from the pit to stop cows from milling in front of the entrance.
Result: quick cow entry.

■ Cow exit

The exit area is about 3 m wide. Even though the cows need to turn on exiting the dairy, there is plenty of room to do so.
Result: rapid cow-flow out of the dairy.

■ Stall gates

Stall gates provide a secure space for cows while being milked. They are not pushed or crushed by other cows while in the milking position.
Result: more rapid cow entry.

■ Stockhandling skills

Milking occurs in a quiet, calm dairy. The cows are treated with respect, with no yelling or hitting. Research has shown that milkers that have good cattle skills will harvest more milk than milkers with poor skills.
Result: quick entry into the dairy and rapid milk out, due to excellent milk let-down.

■ Good operational routine

They are organised milkers working from one end of the pit to the other. Time and energy is not wasted with unnecessary walking.
Result: little wasted time and no excess walking for no purpose.

■ High-producing cows

Cows producing lots of milk mean the clusters are moving more milk each hour.
Result: higher milk-flow rates per hour.

This photo shows Cyril and Leslie's dairy from the entry end.

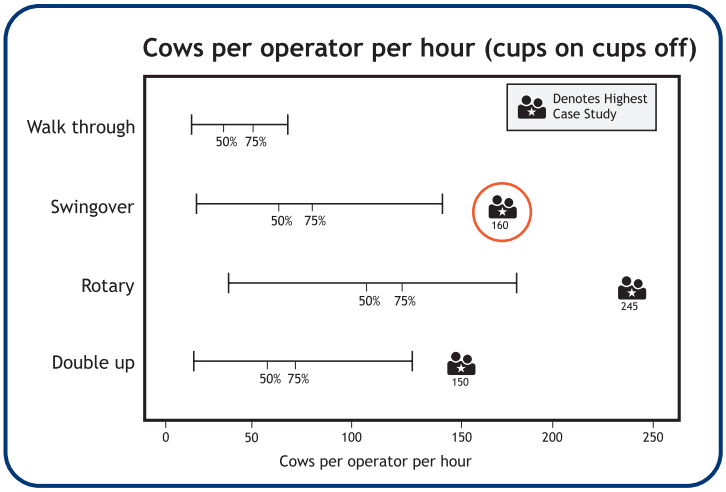
Swingover Case Study 3

Duncan, Tasmania

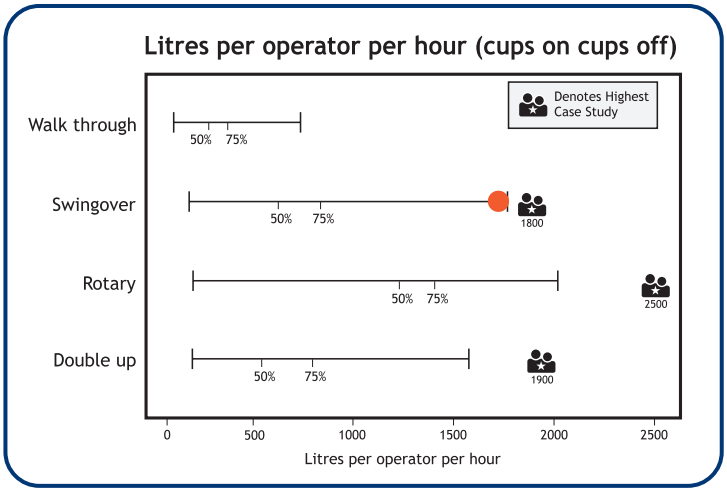
SWINGOVER DAIRY WITH 22 CLUSTERS, MILKING 180 COWS

Duncan's dairy was upgraded from a 6 cluster walk through. He felt a rotary would be too big and expensive for his situation. A swingover would give him better use of the milking clusters, as there is less cluster idle time in a swingover dairy than in a double up. He also wanted a dairy that one person could operate most of the time, but that a second person could be brought in to help in busy times. Therefore, labour productivity was an issue.

Duncan's operation has a cow/operator/hour performance of 160 and a litres/operator/hour performance of 1700. As you can see on the following graphs based on the national survey, that is pretty good for his dairy type.



The cows per operator per hour graph shows Duncan's result of 160 is the top performance measured of any swingover case study.



The litres per operator per hour graph shows Duncan's result of 1700 is within the top 25% of the industry.

PERFORMANCE

Duncan's milk harvesting performance is due to:

- ✓ good dairy design
- ✓ the number of clusters available

Factors that make Duncan's system productive:

■ Number of clusters per operator

Duncan is comfortable operating 22 clusters. They keep him busy and allow for little free time in the pit.

Result: there is little idle time for the operator.

■ Cow-flow

The backing gate is used to keep the cows concentrated at the entry end of the yard. Entry is straight in. Cows are not fed in the dairy, so they leave with out delay.

Result: cow movement in and out is quick and consistent.

■ Clean udders

Well-maintained tracks and laneways mean teats are clean when cows enter the dairy.

Result: less time is required before clusters can be put on.

■ Stockhandling skills

He doesn't yell at or hit the cows. He operates quietly in the dairy, which increases the cows' confidence and their level of comfort.

Result: good milk let-down and rapid milk out rates.

■ Another noteworthy feature

The installation of a 10 horsepower water pump, replacing a 2 horsepower pump, for yard washing. This has greatly increased the volume of water delivered at the end of the hose for yard washing.

Result: greatly reduced yard washing time.

The amount of water available is the key to efficient yard washing. It is better to have high volume rather than high pressure for faster cleaning of the yards.

This photo shows inside the dairy.

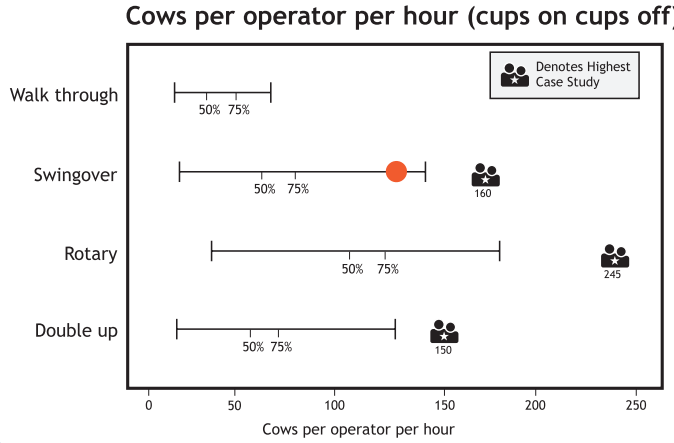
Swingover Case Study 4

Kym, Phillip and Ken, South Australia

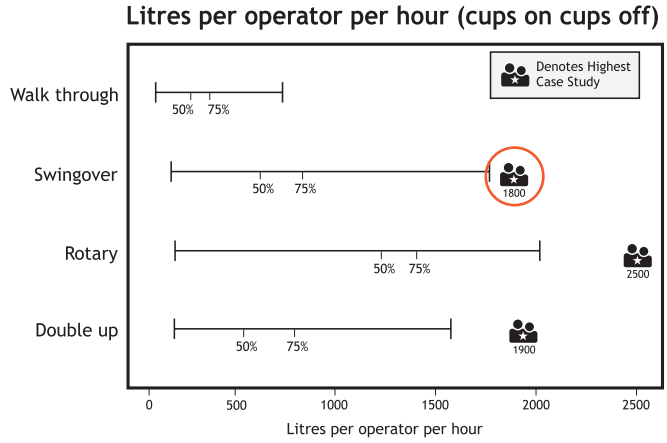
SWINGOVER DAIRY WITH 29 CLUSTERS, MILKING 270 COWS AT PEAK

Kym, his brother, Phillip, and father, Ken, farm in South Australia. Their dairy, a swingover herringbone, came out as a top-performing milk harvesting system based on the national survey data.

The dairy is a simple, no-frills dairy, with a wall on one side only. It is bright and airy. There are no stall gates or other forms of bail dividers fitted in their dairy. Kym and Phillip are the main milkers. They have built a lean, economical milk harvesting system that gives them room to improve when changes become necessary.



The cows per operator per hour graph shows Kym, Phillip and Ken's result of 130 is within the top 25% of the industry.



The litres per operator per hour graph shows Kym, Phillip and Ken's result of 1800 is the top performance measured of any swingover case study.

PERFORMANCE

Kym, Phillip and Ken's milk harvesting performance is due to:

- ✓ maximum use of milking labour
- ✓ good stockhandling skills

Factors that make Kym, Phillip and Ken's system productive:

The biggest factors in their productivity are the size of the dairy and the number of milkers operating it.

■ Dairy size

With 29 clusters, this dairy is larger than most Australian swingover dairies.

■ Number of milkers

One person milks in the mornings during the week and for all the weekend milkings. During afternoon milkings, the farm hand also milks, so there are two milkers then. Each brother takes turns as the main milker. They rotate days so as to have a break from milking every day.

Result: a large number of cows get milked per person and a large amount of milk is harvested each hour per operator.

Not too many milkers would be comfortable operating 29 sets of clusters. That number of clusters per operator is certainly on the extreme upper end of the scale for swingover dairies, according to the national survey.

Research has indicated that the more clusters the milker has to operate, the faster they become with their completion of tasks. Generally, one-operator dairies are more productive per operator than multiple-operator dairies.

However, there is a limit to what can be achieved by a milker. In this case, the brothers (owners and operators of the farm) are doing the main milking.[1] They are not requiring paid labour to operate 29 clusters at a time. Having every other day off milking makes a big difference to them.

■ Cow-flow

Entry from the yard is straight and unhindered.

Grain is fed in the dairy.

There are 3 m provided in the turning area for the exit.

Result: good cow entry and exit times.

View inside the dairy looking towards the exit end.

■ Milk production

At peak production, the cows are averaging 30 litres per day.

Result: high yield per cow with good cow-flow gives lots of milk per hour.

[1] Since this case study was written, family circumstances have changed and labour is now employed to milk. Two milkers now operate the dairy.

Swingover Case Study 5

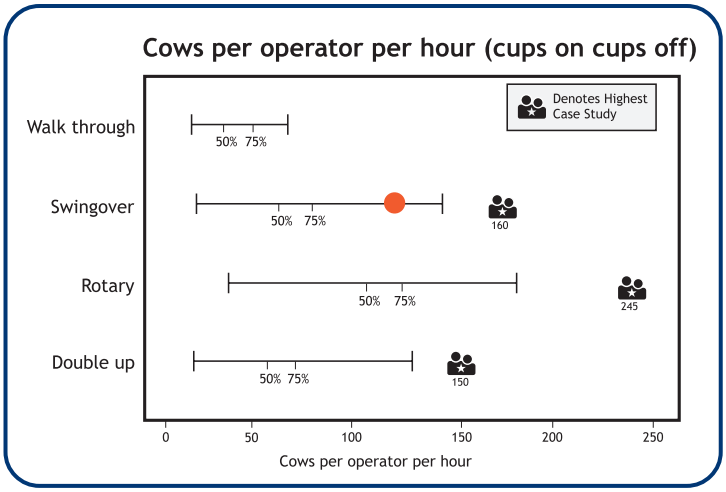
Cliff, New South Wales

SWINGOVER DAIRY WITH 36 CLUSTERS, MILKING MORE THAN 300 COWS

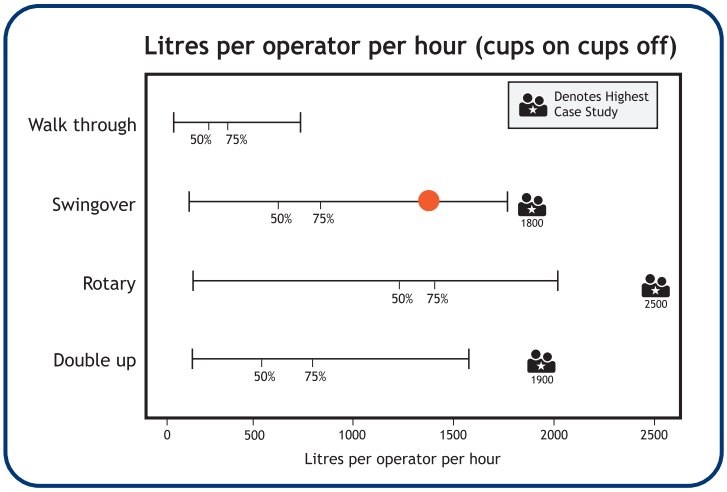
Cliff's milk harvesting process was identified from the survey as one of the top performers in New South Wales. Cliff's irrigated farm was converted to a milking operation in 1993 when a decision was made to try a more profitable agricultural enterprise.

The existing dairy was first built as a hay shed. It now functions as an effective dairy. The dairy is a 36-cluster swingover operated by two milkers. During the peak of their production, they milk some 120 cows per operator per hour and harvest about 1320 litres per operator per hour.

The following graphs, based on cups on to cups off time, show some of the characteristics of Cliff's system that result in it being in the top 25% of the national sample.



The cows per operator per hour graph shows Cliff's result of 120 is within the top 25% of the industry.



The litres per operator per hour graph shows Cliff's result of 1320 is within the top 25% of the industry.

PERFORMANCE

Cliff's milk harvesting performance is due to:

- ✓ a well-planned dairy and yard
- ✓ good stockhandling skills for milkers
- ✓ the milkers staying in the pit

Factors that make Cliff's system productive:

Cow-flow

The dairy is open and bright, with both exit and entry being straight with no corners. This promotes smooth cow-flow into and out of the dairy.

Result: keeps cow entry and exit times to a minimum.

Milkers' use of time

The milkers seldom leave the pit during milking. Cliff stresses that the goal in milk harvesting is getting as much milk into the vat as possible. He would rather milk 33 or 34 cows in a run than have milkers leave the pit to chase in the last one or two cows.

Result: the milkers can concentrate on their work in the pit.

Cow training

Cows have not been conditioned to need a milker to come out of the pit before they will enter the dairy. Leaving the pit frequently stirs up the cows and the operator as well. Agitated cows have poorer milk let-down than calm cows.

Result: calm cows with good milk let-down.

Teat spraying

At cow exit, the first few cows are sprayed and then the exit is opened. The operator then continues to teat spray as the remaining cows exit.

Result: operator time is not wasted standing around watching cows walk out.

Stockhandling skills

The operators are quiet and calm.

Result: cows more at ease and prepared to enter the milking dairy.

Result: promotes milk let-down and results in quicker milk out times.

Use of a rapid dump hot water service

Result: better water temperature to give a better quality clean.

Result: maintains better water temperature to give a better quality clean.

Flood washing

Pads are broken up with a hose before the yard is cleaned by flood washing.

Result: yard cleaning is completed in under 10 minutes.

This picture shows Cliff's dairy, which started out as a hay shed.

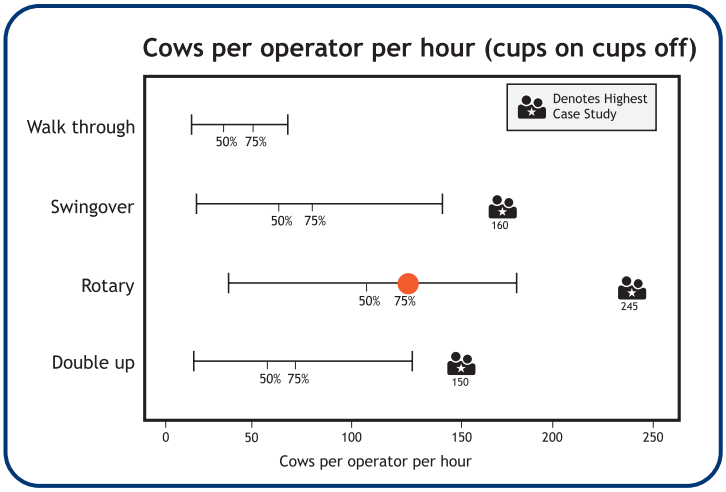
Rotary Case Study 1

Wayne and Joan, Victoria

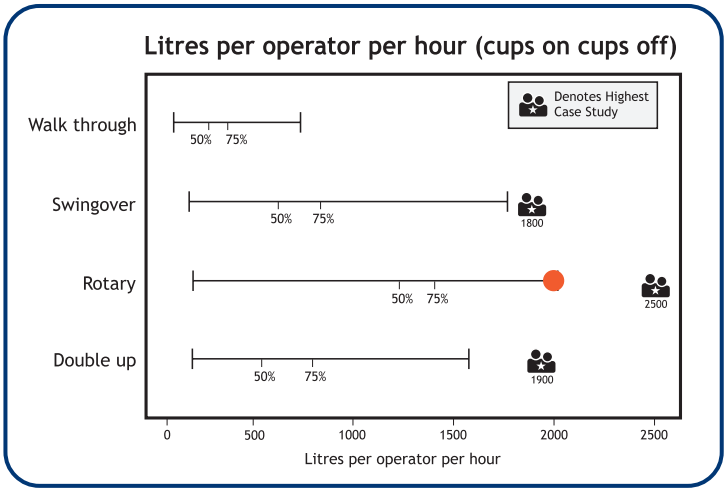
ROTARY WITH 50 STALLS, MILKING 800 COWS

Wayne and Joan built their rotary in the early 1990s. Depending on the season and management issues, they sometimes split the herd into two herds. This reduces cow time off pasture. They feed around a tonne of grain per cow a year on the platform. They are careful to make sure that every aspect of the operation is as efficient and profitable as possible. They do not want to become reliant on too much grain when they can grow grass.

Wayne and Joan operate their farm with the aid of hired milkers. This frees them up to deal with the management of the herd and pasture. Their cows peak at around 28 litres. Their milk productivity at peak is in the order of 125 cows an operator an hour. Their milk-flow rate is about 2000 litres of milk an operator an hour. The graphs below show their operator per hour results.



The cows per operator per hour graph shows Wayne and Joan's result of 125 is within the top 25% of the industry.



The litres per operator per hour graph shows Wayne and Joan's result of 2000 is within the top 25% of the industry.

PERFORMANCE

Wayne and Joan's milk harvesting performance is due to:

- ✓ good stockhandling skills
- ✓ good management

The factors that make Wayne and Joan's system productive:

■ Good stockhandling skills

The cattle are not rushed on the way from the paddock to the dairy. The dairy is open and airy. Milkers operate a quiet, consistent routine. Milkers with good cattle skills are valued. All systems are designed with a good appreciation of cow behavior in mind.

Result: good cow-flow giving good entry to the dairy.

Result: good milk let-down when they are on the platform, giving efficient milk out times.

■ Good management

The dairy is located as close to the centre of the L-shaped farm as possible.

Result: cow walking distances are kept as short as possible.

Laneways are well formed, to improve drainage. The surface material is a clay/sand mix that is 'soft' on cows' feet. Track widths have been increased as the herd size has grown. Drains are outside the laneway fence line. A regular track maintenance program is also used.

Result: cows come into the dairy with clean teats.

Result: lameness is reduced to a minimum.

Roller doors have been installed on the front of the dairy to allow the milkers to open or close them depending on the weather conditions. This allows the milkers to manage the environment where they are working to their satisfaction.

Result: improved operator comfort.

Flood washing has been installed on the twin fall yard.

Result: much-reduced yard washing time.

Plant washdown is completed using a jetter 'clean in place' system. The procedure is well-documented to reduce mistakes and help maintain a consistent result each milking.

Result: consistently good-quality plant cleaning, with little cause for variation.

This photo shows the floodwash tank.

Rotary Case Study 2

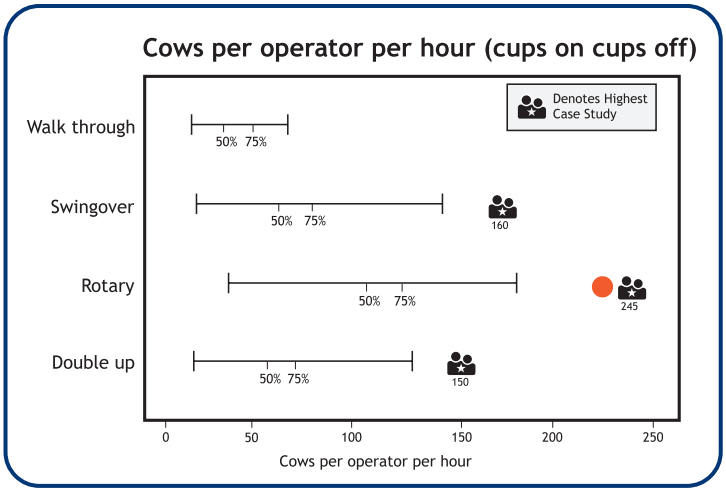
David and Cathy, South Australia

ROTARY WITH 60 STALLS, ONE OPERATOR MILKING 350 COWS

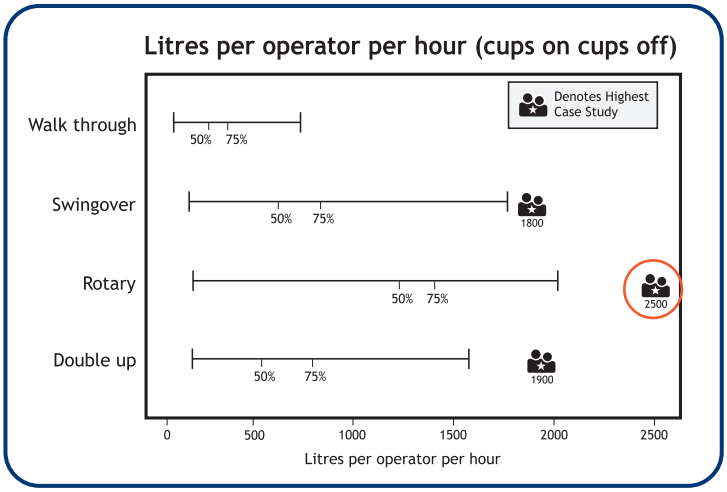
David and Cathy's South Australian dairy land is irrigated. The current herd size is 350 cows, with the potential to grow to 400.

They built a 60-stall rotary about 5 years ago. Their aim is to milk 250 cows an hour[1] with one operator for at least half of the lactation. Their productivity during this phase of the lactation is impressive. They are routinely milking 350 cows in 1½ hours, which works out to 233 cows an hour for one operator. As the following graph shows, this productivity is better than any of the farms included in the national survey benchmark graph for operators in rotary dairies.

[1] This goal has been raised since this case study report was first written, to more than 300 cows an hour for one milker.



The cows per operator per hour graph shows David and Cathy's result of 233 is above the top 25% of the industry captured in this survey.



The litres per operator per hour graph shows David and Cathy's result of 2500 is equal to the top performance measured of any rotary case study.

PERFORMANCE

David and Cathy's milk harvesting performance is due to:

- ✓ good planning
- ✓ good people
- ✓ use of automation

David and Cathy have a good relationship with their labour force. It helps to create an environment where everyone does their best and makes the system operate well.

Factors that make David and Cathy's system productive:

■ Automatic cluster removers

While not a radical technology, David has them set so that they come off when the milk flow reduces to a certain flow rate and/or detaches at 9 minutes, whichever comes first.

Result: eliminates cows going around the platform a second time.

■ Automatic teat spraying

An automated unit installed in the exit walkway sprays teats.

Result: eliminates the need for a 'cups off' operator.

■ Automatic cow identification

After milking, computer records are interrogated to check for any significant differences in cow milk volumes or if any cows have not been milked.

Result: allows the herd manager to check on information about the herd that a single milker might not have had time to observe.

■ Automatic drafting

Located in the exit race, the milker only has to key in the identification number of a cow to be drafted out and the system takes care of the drafting as the cow passes the drafting area.

Result: the milker does not have to leave the working area.

■ Cow-flow

The dairy is well sound proofed, with any noise from the milking plant being vented outside and away from the dairy. Milkers are cow friendly and use a regular, calm routine.

Result: cows are not distracted or disturbed by loud noises.

This photo shows the the circular yard leading to David and Cathy's dairy.

There are panels mounted on the entry and exit race. Cows cannot see the 'cups on' operator during entry. On exit, they cannot see the cows coming on to the platform.

Result: reduces visual distractions that may slow cow entry and exit.

Medical procedures are not carried out on the milking platform. There is a separate area in the yard for these procedures.

Result: cows do not associate the milking platform with unpleasant stimuli.

■ Uniformity of cows udders

Cows with three-quarters can slow down the time taken to attach clusters. David has a uniform herd in terms of udder conformation.

Result: uniformity of udders and teats contributes to less variation when putting clusters on.

Master switches

David has linked up the milking plant, both plate coolers, the compressed air for the automatic teat sprayer, and the manual units and the refrigeration (on a 20-minute delay) to a single master switch. One other switch turns on the platform drive, feed augers and the exit light flasher. The vacuum pumps will not start unless the hose is connected to the vat and the vat tap is turned on.

Result: simplifies the tasks for the milker.

Large-scale gauges

Three temperature gauges monitoring the cooling tower, the chiller and the temperature of the milk into vat are located at the milker's side.

Result: simple and easy to scan by the milker, helping to reduce stress.

Long entry race onto the platform

David believes that stock like to walk up a narrow, confined space.

Result: greatly enhances the cow-flow onto platforms – both rotary and herringbone.

Result: assists with electronic identification (EID) systems.

Passive exit aid

David uses a flashing light to indicate to cows when it is time to exit the platform. David is keen to use some non-physical indicator to increase cow comfort. He likes to keep the milking area quiet and comfortable for the cows. He does not want to train cows to expect some unpleasant experience at any stage while on the platform.

Result: indicates to cows when it is time to come off the platform in a cow-friendly way.

Automated yard cleaning

Automatic cleaning requires only 2 minutes of operator time. The backing gate in the circular yard is fitted with chains that drag on the surface of the yard, breaking up the cowpats. Several water outlets on the bottom of the gate flush the loosened manure away.

The milker only needs to scrape a narrow wedge that the gate does not reach.

Result: saves time and uses less water than a flood wash system – this is important to the farm's operation.

This picture shows the backing gate with chains and water outlets on David and Cathy's yard.

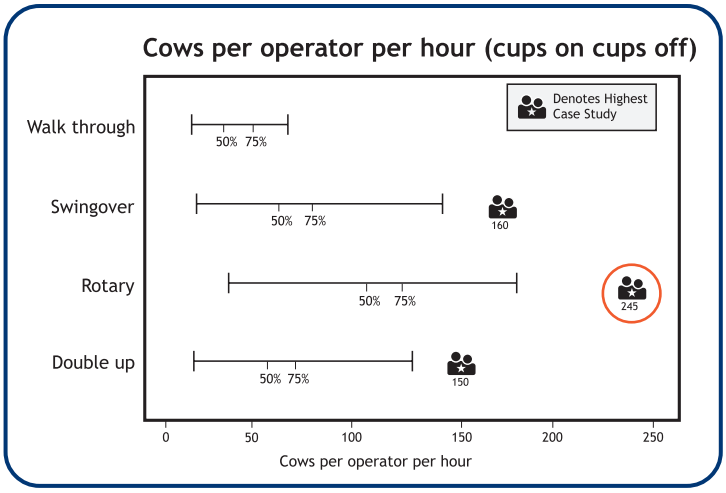
Rotary Case Study 3

Karl, Victoria

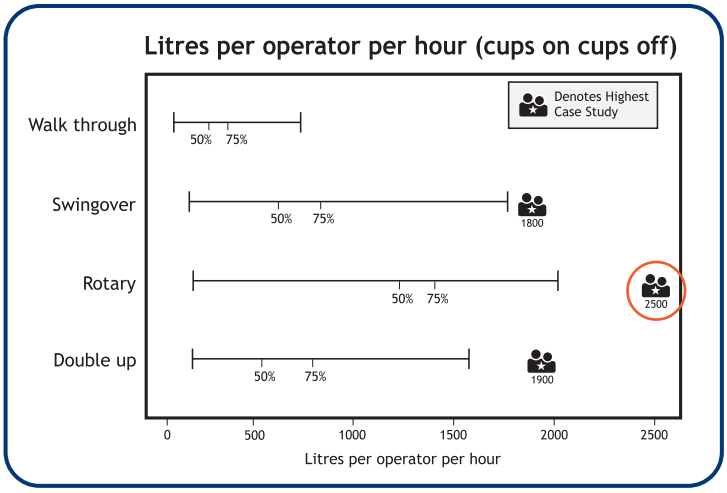
ROTARY DAIRY WITH 50 STALLS, ONE OPERATOR MILKING MORE THAN 400 COWS

Karl is running a herd of more than 400 cows, with the potential to expand to 700. He farms irrigated country in northern Victoria. His dairy system includes the use of a large feed pad, to make sure that he is able to get enough feed into his cows each day. During summer, when pasture growth is not enough to provide for the cows' nutritional needs, they spend half the day on a covered feed pad adjoining the dairy. The covered feed pad also provides shelter during the hot summer days.

The milking plant includes a fully computerised milking and herd management system. Karl is milking with one operator, as he uses automatic cluster removers and an automated teat spray system. The single operator milks at a rate of 245 cows per operator per hour and harvests 2554 litres per operator per hour.



The cows per operator per hour graph shows Karl's result of 245 is the top performance measure of any rotary case study.



The litres per operator per hour graph shows Karl's result of 2554 is the top performance measure of any rotary case study.

PERFORMANCE

Karl's milk harvesting performance is due to:

- ✓ good planning
- ✓ use of automation

Factors that make Karl's system productive:

Karl has converted his rotary into a one-man operation by making use of technology in the following ways:

■ Electronic ID

Makes individual feeding possible on the platform and is required for drafting. After milking, cow production information can be monitored.

Result: less time needed during milking to monitor cows.

The photo shows the 'cups on' operator at work.

■ Automatic teat spraying

This is installed in the exit race.

Result: one less task for milkers to perform.

■ Automatic cluster removers

These are used to ensure the consistent milk out of the cows and to remove a work routine task.

Result: less work routine time is required per cow.

■ Activity monitors

These are checked after milking to determine whether a cow is in heat [oestrus] or not.

Result: the milker does not have to check tail paint.

■ Conductivity sensors

These allow checking for mastitis after each milking for each cow.

Result: simplifies the tasks for the milker who is operating at the 'cups on' position.

■ Automatic drafting

Any cows to be drafted out are entered into the computer system and are automatically cut out as they pass the drafting system.

Result: one less task for the milker.

■ Automatic backing gate

At each quarter turn of the platform, a block of wood activates a switch, moving the backing gate enough to make up for the cows that have come on to the platform.

Result: one less task for the milker.

The end result of of this automation is that one person can milk comfortably. When observed, the platform was turning at a rate of 12.5 seconds a stall, so the 'cups on' operator was not overly pushed to complete their tasks.