

Dairying in the 21st century

Robots milk cows in most advanced dairies. 500 cows per hour can be milked, compared to about 30 cows per hour in the 1960s.

Computers recognise individual cows and adjust their feed automatically.

Farms have equipment and structures made of iron, steel, stainless steel, aluminium, plastics, Kevlar and optical fibre.

High-tech tractors, very large farm machines and irrigators that water large areas decrease labour.

Electric fences allow grazing management of each paddock. Pastures grow high yielding pasture and crop plants, and fertiliser application is precise. Sensors monitor soils, crops, animals and weather.

Fast trucks carry refrigerated milk tankers and bring cattle feed from other farms. Fresh milk is sold thousands of kilometres from where it is produced. Airlines freight fresh milk overseas.

Milk is made into a huge range of products.

Modern dairy cows

Modern dairy cows are large and produce a lot of milk.

Dairy cows in Australia now average 15 litres of milk per day. That's 5,500 litres per cow per year.

Milk production per cow has doubled in the past 30 years due to advances in genetics, pasture management and supplementary feeding.

In Australia about 75 per cent of all dairy cattle are the Holstein breed (also called Friesians).

Some Holsteins average more than 27 litres of milk per day.

Other breeds include Jerseys, Australian Illawarra Shorthorns, and crosses between different breeds.

Most modern cows have their horns removed when they are calves. This minimises damage to people, equipment and other cows.



**A herd of Holstein cows walking to the dairy to be milked.
They are large cows that produce a lot of milk.**

Cows can get stressed

All cows have an in-built mechanism to allow the milk stored in their udders to flow into their teats. This is called milk 'let-down'.

When a calf suckles, the cow releases a hormone into her bloodstream that makes the udder let-down the milk.

In dairies, putting milking cups on, and the general milking routine, stimulates cows to let their milk down.

If cows are stressed they will not let their milk down and cannot be milked properly.

Cows can be stressed by noise, rough handling, dogs, changes to routine or equipment, and sore teats.



Gentle handling and sticking to a routine is important to avoid cows becoming stressed.

Hygiene: clean and healthy

Good hygiene in the dairy is vital to producing clean milk.

Cow's teats are washed before milking if they are very dirty.

Cows can get infected udders. This is called mastitis and is a common disease in dairy cows.

Mastitis can be minimised by good hygiene and well-designed milking machinery that is gentle on cows.

Udders infected with mastitis often feel hard and hot.

Cows with mastitis are treated with antibiotics. These cows must be milked separately and their milk thrown away. It cannot be sold.

Modern dairies have automatic gates that can send cows to different pens. This makes it easier to isolate cows that need to be treated or observed.

Robotic milking machines can detect changes in the milk that might indicate a cow is sick and needs treatment.



The Rotolactor: 1950s high-tech

A rotary dairy uses a rotating platform to milk large numbers of cows in a short time. Australia's first rotary dairy was at Menangle and opened in 1952.

Called a rotolactor, it was built by the General Manager of Camden Park, Edward Macarthur Onslow, who had seen one in America. The rotolactor held 50 cows. Each cow was milked and fed as she did one complete circuit.

The rotolactor was an Australian icon. In the 1950s and 1960s up to 2,000 visitors a week saw it in action at Menangle. Overall, about three million people visited it.

There was a milk bar at the rotolactor, also operated by Camden Park. It served milk shakes and ice creams to visitors and was extremely popular.

The rotolactor closed around 1977 but reopened a few years later. It finally closed about 1983.

There was only one rotolactor in Australia but now there are many rotary dairies. The rotolactor was the forerunner to them and decades ahead of its time.



The rotolactor at Menangle, the picture on the right shows cow being milked on the rotolactor, watched by a group of officials. Members of the public could view the milking form outside through large windows.

Artificial insemination

BREEDING BY PROXY First Calf at Camden

The birth of an artificially-bred calf on the Camden Park Estate at the week-end marked the beginning of a new era in dairy cattle improvement in Australia.

In August of last year, the officer-in-charge of the McGarvie Smith Animal Husbandry Farm at Badger's Creek, Mr. H. J. Geddes, flew to New Zealand with a test tube containing the life germs collected from a Guernsey bull at the Glenfield Research Station. These were used to inseminate a number of dairy cows at the Ruakura Experiment Farm near Hamilton. On his return, Mr. Geddes brought back sufficient Jersey semen to treat six cows here. One of these was at Glenfield and the others on the Camden Park Estate. Four of the latter herd, and the first one to calve was the Avshire shown in our picture. The calf was dropped on Friday.

Mr. Geddes said yesterday that he was thoroughly satisfied with the results of this initial trans-Tasman experiment. It opened up great possibilities in the way of herd improvement. New Zealand, he said, was a long way ahead of Australia in the work, but both the Federal and New South Wales Governments had decided to support artificial insemination schemes here. Only proven bulls of high production heredity were used, and as exchanges could be made regularly between the Commonwealth and New Zealand it should be practicable to raise the standards on both sides of the Tasman.

It might even be possible to exchange semen with U.S.A., but that was something for the future.

The success of the present experiment, Mr. Geddes said, was due to enthusiastic co-operation of the manager of the Camden Park Estate, Mr. J. S. Haddin, and his staff, the director, Dr. Hindmarsh, and staff at Glenfield, and the veterinarian in charge of insemination at Ruakura, Mr. James.

Artificial insemination (AI) has revolutionised the dairy industry. It allows maximum use of the best bulls to breed high producing dairy cows.

Semen is collected from bulls and then frozen. Later it is used to inseminate cows to get them in-calf (pregnant).

With AI, dairies do not need to keep bulls and can get their cows in-calf to superior bulls.

AI controls sexually transmitted diseases that are spread from bulls to cows.

In May 1945 the first calf conceived by AI in Australia was born at Camden Park.

Camden Park pioneered the use of AI in the district and ran its own AI program in the 1950s, years before AI became commercially available.

In the early days, semen was chilled (cooled) after collection but from 1960 it was frozen. This means semen from anywhere in the world can now be used.

Newspaper clipping:
Sydney Morning Herald
22 May 1945 p8.



Bull yards and pens including evidence of demolished sheds.

Source: Six Maps (<https://maps.six.nsw.gov.au/>)

High-tech identities for cattle

Electronic identification of individual cattle is compulsory for all cattle in Australia.

Each animal has its own digital identity, in the form of a microchip embedded in its ear tag or even inside a device in its stomach.

Electronic ID of individual cattle is part of the National Livestock Identification Scheme (NLIS).

The NLIS is important for tracking animals and controlling disease outbreaks. It enables all meat to be traced back to the farm that it came from.

In high-tech dairies, electronic IDs allow the farmer to keep records such as milk production for each cow.

Electronic IDs also mean each cow can be fed according to its level of production.

In robotic dairies, a robot reads the tag when the cow comes in for milking. Farmers can also read the tag by using a hand-held microchip reader called a wand.



The cow and calf both have an electronic ID tag in their ear. The circular white disc contains a microchip and is part of the National Livestock Identification Scheme (NLIS). The large hanging ear tags are for farm management.



Robotic dairies

The first robotic dairy in Australia was installed in 2001.

Automated milking systems are used on some dairies to reduce the amount of labour required for milking.

In these systems the cows are milked by robots.

As cows enter the dairy for milking, a robot reads their electronic tags and recognises each individual cow.

A robotic arm cleans the cow's teats before milking.

Every cow's udder is different—teats can be far apart or close together or unevenly spaced. Some cows have only three teats.

The robot remembers each cow's udder and knows where to put the milking cups. It uses a camera to guide it as it puts the cups on the cow.

Cows are usually fed while they are being milked.

A computer dispenses the correct amount of feed for each cow according to its production needs.

In many robotic systems, the dairy is open 24/7 and cows can walk in to be milked at a time that suits them.

The farmer can monitor the system remotely through a mobile device.



A robotic dairy. The image at top right show three robotic arms that place the cups on the teats. The image at bottom right shows the robotic arm in action as its sensors find the teats before putting the cups on.

High quality dairy products



Hygiene is the highest priority for dairy products, from the dairy all the way to the consumer.

When a cow is milked, the milk comes out warm, at 37°C. It is cooled in the dairy to 5°C or less and kept cold while being transported to the factory to maximise milk quality.

At the factory the milk is pasteurised to kill germs.

Often milk is also homogenised to stop the cream separating from the milk and rising to the top.

Strict government standards regulate milk handling from the dairy to retail sale. These include milk processing, use-by dates for dairy products and the temperature of refrigerated cabinets where they are stored.

The NSW Food Authority oversees the standards in this State.