FUTUREDAIRY information sheet

Milking robots

Making the most of money invested

by Kendra Kerrisk

Every new dairy involves a major financial investment and automatic or 'robotic' milking systems (AMS) are no exception.

To make the most of the capital outlay involved in installing an AMS, aim to optimise unit utilisation.

In an AMS, unit utilisation is a measure of how 'busy' each automatic milking unit is on a given day.

For optimal unit utilisation the automatic milking unit needs to be used fairly continuously throughout the night and day, with minimal idle time.

The table outlines the potential utilisation levels in well-managed systems in Europe and Australia.

Unit utilisation is influenced by the number of cows milked by a milking unit, number of litres harvested per unit and the number of times cows are milked each day.

This is because a grazing system involves cows voluntarily moving around the system – from paddock to milking unit and back to the paddock again.

Potential achievable machine utilisation levels from well managed systems during periods of high utilisation.

	Typical European System	Australian pasture based system, Camden: Peak of season	Australian pasture based system, Camden: Annual average
Average machine utilisation	90%	80%	67%
Number of milkings/machine/day	170	150	118
Milk (litres) harvested/machine/day	2,300	2,000	1384

The typical European system would involve cows being housed indoors and fed a TMR diet. This would be a well managed controlled cow traffic system whereby cows can freely move from a loafing area to the feed table but must pass through a drafting gate to get from feeding to loafing or vice versa. This type of system would have cows walking minimal distances with easy access to the milking station.

The Australian pasture-based system is one whereby cows are in a pasture-based system with supplementary feed made available as required and cows are supplemented with 1.0 to 1.5 tonne concentrate/cow/year. In this scenario it is assumed that cows would be milked about twice a day and would produce about 7,500-8,000 litres/cow/year.

Grazing production system

Achieving optimal unit utilisation is more challenging under Australian grazing conditions than in Europe where cows are housed in doors most of the time, or in a feedlot situation.

Grazing cows are also more likely to have a defined sleep period during which very few cows visit the milking units.

Unit utilisation is most affected by the number of cows in milk and the number of times they are milked each day (milking frequency). Research carried out in New Zealand suggests that unit utilisation in a grazing system can be improved by providing the cows with three fresh breaks of pasture a day, instead of two.

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FutureDairy is investigating refinements to its system to improve unit utilisation. Some options include encouraging cows in early lactation to visit the milking units more often. At Camden, cows in early lactation usually represent about half the herd.

A year-round calving system may achieve more even unit utilisation throughout the year if there are similar numbers of cows in early, mid and late lactation most of the time. In a seasonal calving system, unit utilisation will vary throughout the year.

For more information

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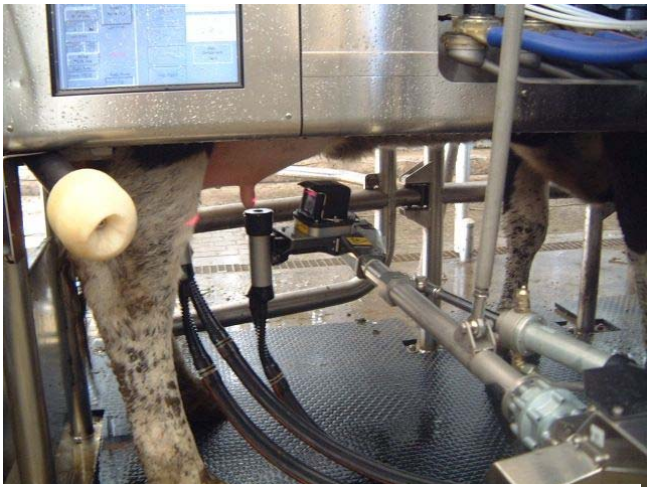

To operate at optimum utilisation, an automatic milking unit needs to be used fairly continuously throughout the night and day, with minimal idle time.

About FutureDairy

FutureDairy aims to help Australia's dairy farmers manage the challenges they are likely to face during the next 20 years. The challenges are expected to be related to the availability and cost of land, water and labour; and the associated lifestyle issues.

Our activities are structured around two priority areas – Precision farming (including automatic milking and innovations) and Feedbase (forages and feeding). These are the areas where there are opportunities to address the challenges related to water, land and labour resources.

For Precision Farming we are investigating technologies with potential to improve farm productivity, efficiency, labour management or lifestyle. FutureDairy is pioneering the development of pasture-based farming systems that use robotic milking for larger herds. Our research is conducted at Australia's first automatic milking system (AMS) research farm, at the NSW Department of Primary Industries' Elizabeth Macarthur Agricultural Institute at Camden. From mid-2009 we will be testing a new concept automatic milking system designed specifically for Australian conditions, while continuing to further develop the farming system around the milk harvesting equipment.

Our Feedbase goal is to develop sustainable dairying systems for the future, with the intensification of home-grown feed to enable more efficient use of land, water and grain. Our trials are being conducted at the University of Sydney's Corstorphine dairy farm and Mayfarm. The investigation is complemented with modelling and component field research in areas of forage production and utilisation.

We are investigating a complementary forage system (CFS) that involves triple cropping on 35% of the farm area and growing pasture on the remaining 65%. Our target is to produce more than 25t DM/ha/y rover the whole farm area, in a sustainable way. The three crops include:

- a bulk crop (eg maize);
- a legume for nitrogen fixation (eg clover); and
- a forage to provide a pest/disease break and to improve soil aeration (eg a brassica).

FutureDairy is now in its second phase. During the first phase, we used existing technology for automatic milking to test the feasibility of robotic milking in a pasture based system. The promising results paved the way for testing a new prototype AAMS with a larger herd during phase 2.

In the first phase, our Feedbase studies tested the feasibility of a complementary forage rotation grown on a small area, both under research and commercial conditions. Phase 1 combined technical research with social research and extension research. During phase 2 we are drawing upon that learning experience to improve our linkages with major extension groups.

Contact us

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