FUTUREDAIRY information sheet

Farm layout for automatic milking

By Kendra Kerrisk

Interest in automatic milking systems (AMS) is growing steadily in Australia. If you are considering an AMS for a grazing-based system, one of the first decisions will relate to farm layout.

Overseas AMS are based on systems where cows are generally housed indoors. FutureDairy has demonstrated that AMS can be incorporated into Australian grazing systems without compromising pasture utilisation, which is the key to the profitability of most Australian dairy businesses.

To be successful, an AMS must achieve:

- Voluntary milking (most cows present themselves to the dairy for milking without needing to be fetched from the paddock);
- Distributed milking (the milking units are used evenly throughout the day and night; there are not periods where cows are waiting a long time in the yard to be milked).

FutureDairy's experience with the Camden AMS has shown it is possible to manage the system with various levels of supplementation to achieve voluntary and distributed milkings.

Layout can affect cows' willingness to move to the dairy and around the farm and therefore will affect voluntary movement, milking distribution and pasture utilisation.

Most farm layouts will be suited to AMS, but there are four key areas to consider at the planning stage:

1. distance to the furthest paddock
2. 'barriers' to voluntary movement
3. number of laneways
4. feedpad.

Distance

Anecdotal evidence suggests the greater the distance between the paddock and the dairy, the less willing cows will be to voluntarily move to the dairy.

At FutureDairy's Camden AMS, the longest distance from pasture to the dairy is 1.2km and this has been manageable. FutureDairy hasn't investigated distances beyond 1.2km but it is recognised that it is possible to manage paddocks that are less than ideal in location or orientation, if they represent a small proportion of the farm.

Management changes may include ensuring cows are voluntarily moving out of 'difficult' paddocks during day time hours when staff will be in a better position to encourage cow traffic.

Barriers

When planning AMS farm layout, it is important to avoid potential barriers to voluntary movement.

It's simply not possible to achieve voluntary movement if cows are expected to cross a public road or railway line. River crossings and the like are not necessarily a barrier to voluntary movement. A good guide is how willing or reluctant they are to cross when herded.

If cows need to be encouraged to move through an area of the farm when herded, it is likely to affect voluntary cow flow with an AMS.

Laneways

It is possible to achieve high pasture utilisation and efficient AMS operation with a farm layout including a single divided laneway (with a fence running down the centre) leading from the dairy. This is the case at FutureDairy's Camden AMS.

However, a farm layout with two or three laneways leading from the dairy offers more flexibility to offer the cows three pasture breaks a day. This can be useful for improving the regularity of voluntary cow movement and reducing the variation of milking frequency. The diagram on page 2 shows a farm layout which has a single laneway branching in two directions just down from the dairy. This allows two or three fresh breaks of pasture to be offered each day.

Feedpad

If you plan to include a feedpad in a grazing-based AMS, the location is quite important. Ideally it should be located with laneways and gates that allow for either

pre-milking feeding or a combination of pre and post-milking feeding. However a simpler system may suit some operations.

Pre-milking access will ensure that cow access to the feed is not limited by the milking frequency of the herd especially when part, or all, of the herd is set for a reduced milking frequency at late lactation. The feedpad can act as a third break of feed if it has space for loafing.

Every farm layout involves some compromises and AMS is no exception. While the layout at Camden is not ideal high pasture utilisation, high productivity and efficient use of the automatic milking units are achieved.

For more information

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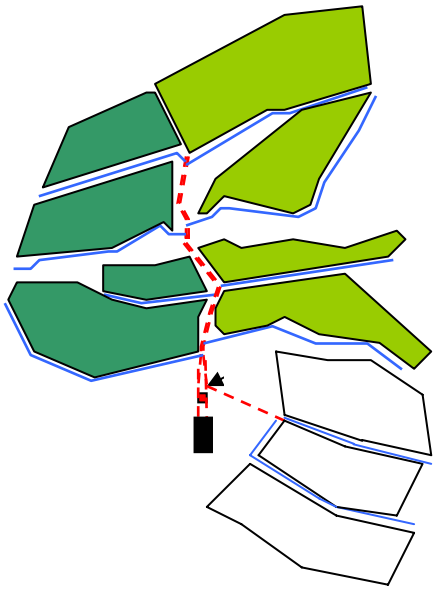

Farm layout with one split laneway leading off from the dairy and an additional branched laneway leading to a third un-shaded block of pasture for grazing which would allow for three pasture breaks per day.

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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