

# Moorepark'13

## Irish Dairying | Harvesting the Potential

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# Robotic Milking from Pasture

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## Summary

- Automatic milking (AM) is becoming an accepted new technology for milking cows across Europe.
- Cows decide when they come for milking, are normally milked one at a time, and the milking of the herd is therefore distributed over a 24 hour period.
- Practical challenges to integrating AM and grazing include (a) initiating cow movement to visit the AM unit; (b) queuing of cows for milking; (c) achieving high utilisation of the AM unit to minimise capital costs; (d) seasonal calving pattern - peak milk yields.
- AM could represent a suitable milking management system for Irish dairy farmers
- Successful integration of AM into a pasture system was achieved at Moorepark in 2012.
- Significant questions remain relating to the ability to manage pasture, changes to farm infrastructure and capital investment.

## Introduction

During recent decades, new milking management systems have been introduced, of which development of AM systems is a significant step forward. AM has become an established management system, considered as an alternative to conventional manual milking methods, particularly in Western Europe. This trend is increasing and it is envisaged that up to 20 per cent of cows in Europe will be milked by AM systems by 2020. Additionally, studies in New Zealand and Australia have shown that AM can be successfully incorporated into both all-pasture systems and pastoral dairying systems incorporating moderate levels of supplementary feed. This system offers possibilities for precision management of individual cows in a herd, freeing up labour and allowing the cow greater control of her activities.

Of the 18,000 dairy herds in Ireland, many are milked in herringbone parlours by owner operators who have been farming for many years. Some of these parlours will require updating in the coming years and owners will also consider their future regarding maintaining their dairy operation and the possibility of reducing the dairy labour requirement. Thus, is automatic milking an option? Automatic milking is a new technology for Irish dairy farmers and information is required on how AM could be integrated within Irish farming systems.

## What is automatic milking?

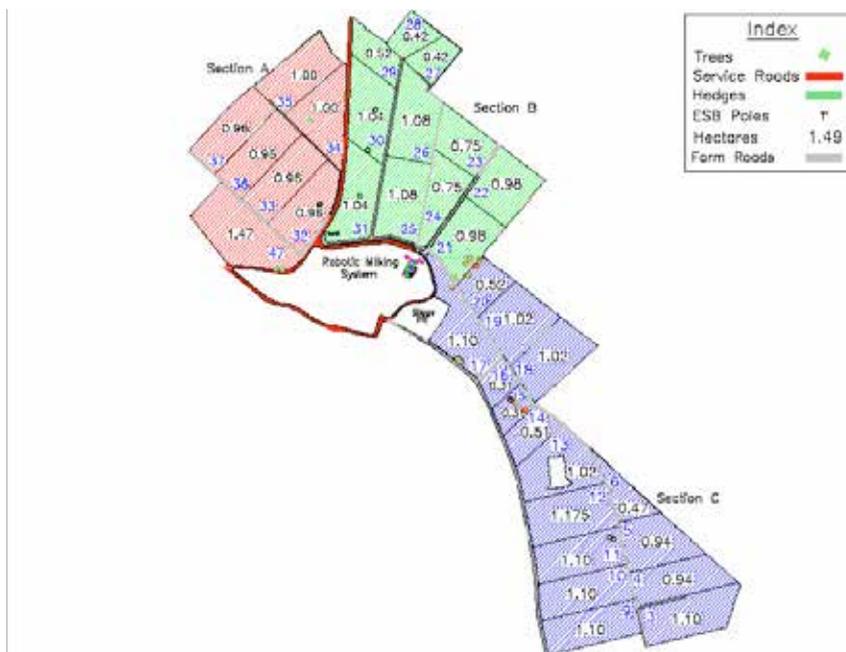
The principle of an AM system requires a significant change in approach to herd and farm management (compared to milking in a conventional system) for two main reasons: (i) cows volunteer themselves for milking (where grass or meal is a motivator) and are normally milked one at a time, and (ii) milking is distributed over a 24 hour period.

## Is AM technology relevant to Irish dairy farms

The concept of AM could be very relevant to dairy farming in Ireland. An increase in national milk production by 50 per cent is anticipated in the coming years. However, land as a resource is limiting, farm fragmentation is an issue and the quantity and quality of skilled labour are in increasingly short supply. If AM is to be considered as a serious alternative to conventional milking in Ireland, then it has to operate with a similar cow nutritional strategy as a conventional milking system and focus on cow utilisation of grass. This is the challenge posed. An additional consideration for an AM farm is production per AM unit or system. Increasing the number of cows milked and reducing the individual cow milking frequency can increase milk production per AM system. This approach (as opposed to maximising milk production per cow) is more suited to a pasture-based system.

## AM at Moorepark

An opportunity to research AM at Moorepark was provided by the Fullwood Company who recently installed a Merlin AM unit at the Dairygold Farm, Teagasc Moorepark. There were 72 cows (36 Friesian, 16 Jersey Friesian cross and 20 Norwegian Red) on the AM system during 2012. The farm-let consisted of a 24 hectare milking platform. The land area was divided into three grazing sections, which were further divided into 1ha paddocks (Figure 1). Grass allocation is critical to optimal cow visits to the AM unit. Cows move between and graze the defined areas or portions of each of the three grazing sections during each 24 hour period. A visit to the AM unit is integrated into the cow movement from one grazing section to the next. Cows grazed to an average post-grazing sward height of 4.4 cm. All cows received ~1.4 kg concentrate feed per 24 hour period during most of the lactation.



**Figure 1.** Map of AM farm incorporating grazing sections A, B and C

## Production data

An average milk yield of 4,500 litres and milk solids (MS) yield of 351 kg/cow lactation was achieved. Total milk volume and MS produced by the AM unit was 284,592 litres and 22,834 kg, respectively. The average number of milkings/day was 108, ranging from 125 to 80/day in the March-May and October/November periods. Average number of milkings/cow/day was 1.8, ranging from 2 to 1.5 in the March-May and October/November periods, respectively. Each milking averaged seven minutes duration. Average milk somatic cell count (SCC) of the herd was 133,000 cells/ml and herd average total bacterial count (TBC) was 18,000 cells/ml.

## Conclusion

Successful integration of AM into a grass system was achieved in the study conducted at Moorepark, however the economic viability of AM will determine how widely the technology will be adopted.