



Automatic Milking Systems in Ireland

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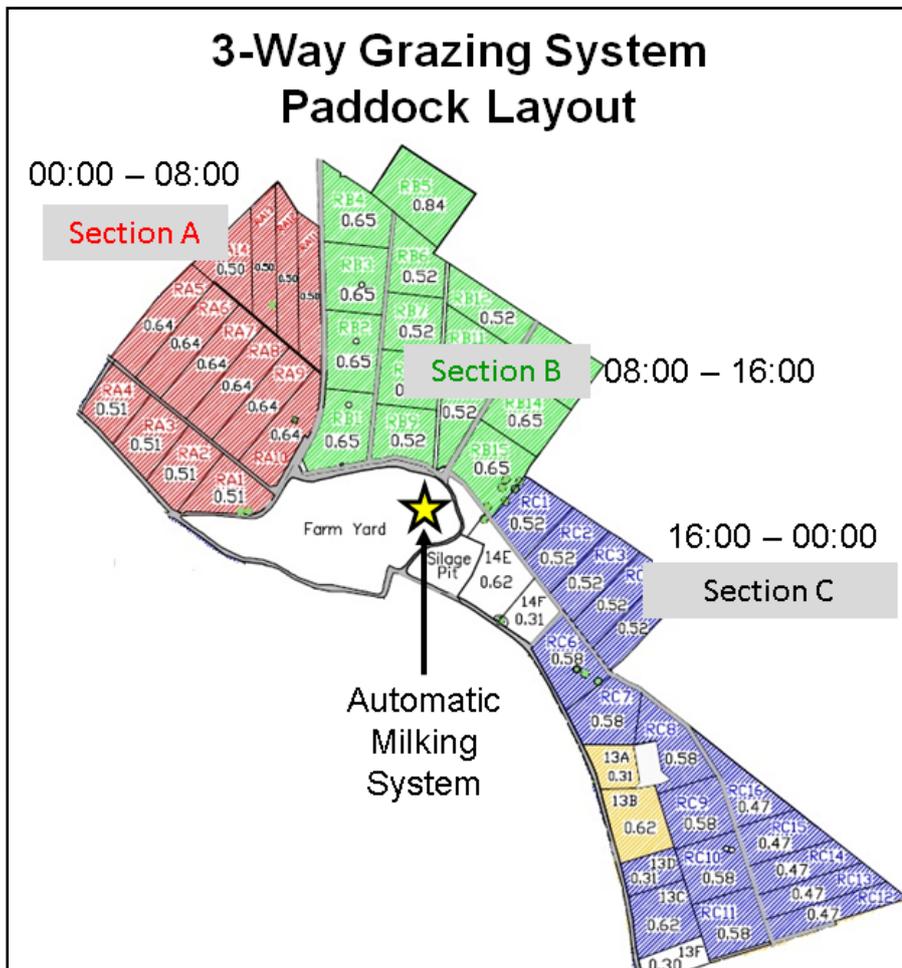


In Ireland and Europe the uptake of automatic milking systems (AMS) is increasing at an accelerating rate. The main reasons being an improvement in lifestyle, reducing physical work, difficulty in attracting skilled labour, potential to increase milk production (within high input systems) and lower labour costs. Anecdotal evidence suggests that by the end of 2014 there will be 200 robots on the island of Ireland. With the removal of milk quotas in 2015, farmers are now looking towards more labour neutral, economically sustainable methods of herd expansion to increase milk production and are considering robots as a potential option to achieve this. In the south of Ireland the majority of robots currently in operation are integrated with a grazing based system of farming.

In order to determine if automatic milking is a sustainable alternative to conventional manual milking in Irish grass-based systems, the integration of automatic milking and grazing must be researched. Teagasc Moorepark in association with the Irish Grassland Association acquired European Union funding for three years to carry out research on how best to integrate automatic milking with grazing and to define if this integration is an economically, environmentally and socially sustainable option for the future of dairy farming in Ireland. This research involves assessing information generated both on the Teagasc Dairygold research farm in Moorepark and on 7 Irish commercial (“monitor farms”) farms that are currently operating automatic milking in a grass-based system.

Voluntary Automatic Milking and Grazing

Automatic milking with grazing relies on the voluntary movement of the cow from the paddock to the automatic milking unit. Cows are motivated to leave the paddock they are in when grass is depleted with the incentive to move to new fresh grass in another paddock. Therefore the grass allocation is critical to optimal cow visits to the AM unit. In order to be granted access to fresh grass cows must first pass through a drafting gate that determines if the cow: (1) is due for milking in the automatic milking unit, or (2) has access to the same paddock she came from, or (3) can progress to a new paddock with fresh grass. The drafting gate in the yard is timed to change either every 12 hours in a 2-way (AB) system or every 8 hours in a 3-way (ABC) system of grazing permitting access to new grass. In a 2-way system the farm is divided into two blocks of land, A and B, and in a 3-way system the farm is divided into 3 blocks of land, A, B and C, that are independent of each other.



Automatic Milking at the Teagasc Dairygold research farm in Moorepark

The Teagasc Dairygold research farm in Moorepark associated with the automatic milking unit operates a 3-way system of grazing. The farm has a 24 ha milking platform and the land area is divided into three grazing sections of approximately 8 ha each (A, B, C). Cows have access to the grazing sections A, B and C at 8 am, 4 pm and midnight, respectively (Fig. 1).

There are separate entry points, each with non-return texas gates, from each of the three grazing sections to the outer pre-milking yard. Cows pass through a pre-selection gate and they are drafted into the inner pre-milking yard if they are due for milking. Once milked they pass through a post-selection gate that directs them to one of the three grazing sections depending on the time of the day. If a cow is not due for milking at the pre-selection gate she is drafted along a bypass lane directly to the post-selection gate and straight out to grass in one of the three grazing sections (Fig. 2).

Fig. 1 Layout of AMS farm - cows have access to the grazing sections A, B and C at 8 am, 4 pm and midnight, respectively.

At present there are 70 cows milking on one Fullwood Merlin 225 automatic milking system. The average calving date for the herd is the 24/02/2014, with a start date of 16/01/2014 and end date of 06/04/2014. The herd consists of two heifers, 38 cows in 2nd lactation and 30 cows in 3rd lactation or more. The average economic breeding index for the herd is €189 and the breeds include Holstein Friesians (44), Norwegian Red crosses (14), 100% Jerseys (4) and Jersey Holstein crosses (8).

Cows were on-off grazing from the 3rd to the 27th of February and the herd were fed silage indoors for 16 hours and 3 kg grass DM/cow, grazing outdoors for 8 hours between 8 am

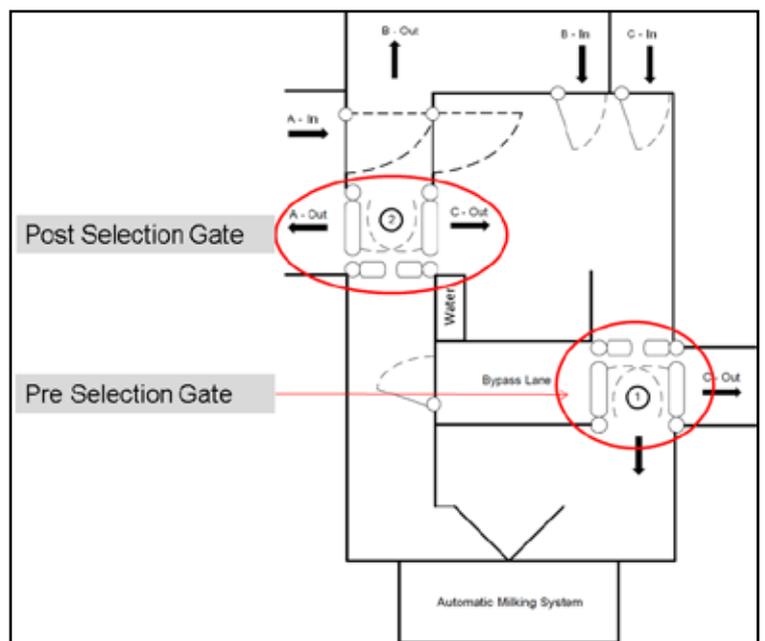


Fig. 2 Selection gates at the AMS unit.

and 4 pm with 4 kg concentrate/cow fed in the AMS each day. Cows were full time outdoors grazing from the 27th of February and concentrate was reduced to 0.5 kg/cow from the 10th of April.

Update on the Current Research Grazing Management and Performance

A farm grass walk is undertaken twice a week and a cover is estimated by visual assessment for each paddock in the grazing blocks which are treated as three independent farmlets with regard to grass budgeting. The most recent grass walk, at the time of writing this article, was carried out on 12th June and A, B and C farm covers of 564, 604 and 592 kg DM/ha, respectively, were observed, with farm cover per cow at 181, 179 and 157 kg DM/LU, respectively. The average growth rate across all blocks was 71 kg DM/ha/day and farm demand was 58 kg DM/ha/day. On the AMS farm the paddocks are currently (at the time of writing) in the 4th rotation in each of the grazing sections. During 1st, 2nd and 3rd rotations the average covers grazed were 1547, 1459 and 1448 kg DM/ha in A, B and C, respectively, ranging between 500 and 2500 kg grass DM/ha. Across the three grazing sections the average pre-grazing height was 11 cm ranging between 5 and 20 cm, and post-grazing height was 5 cm ranging between 3 and 9 cm. During March, April and May, 12.1, 13.6 and 15.9 kg grass DM was offered to each cow/day with an additional 3.6, 1.2 and 1.3 kg concentrate offered at the AMS, respectively.

Peak milk production from the AMS unit per day was recorded during April at 1465 kg (range 1155 to 1666 kg) when the full complement of 70 cows were milking. Milk production per day from the AMS unit ranged from 543 to 1459 kg during March and from 1010 to 1492 kg during May. Average production/cow per day was 19.8, 20.8 and 18.3 kg and milking frequency was 1.7, 1.7 and 1.6 times per day in March, April and May, respectively. A point to note is that an experiment on milking frequency commenced in May and this may have influenced the average milking frequency for the herd.

Milk composition data during the March to May period indicated average fat, protein and lactose percentages of 4.58%, 3.54% and 4.81%, respectively. Milk somatic cell counts have been low with levels of 110 ×10³ cells/ml, 87 ×10³ cells/ml and 89 ×10³ cells/ml recorded during the past three months.

Milking Frequency Trial (May)

An experiment has been underway since 1st May this year to determine the effect of milking frequency on cow milk yield. Two groups of 35 cows each, with similar parity, days in lactation and breed were established. One group of cows had access to the robot 2 times a day and they achieved a milking frequency of 1.4 per day, the other cow group had access to the robot 3 times a day and they achieved a milking frequency of 1.8 per day. Preliminary results indicate similar milk yield per day and per month for cows milking either 1.4 or 1.8 times per day.

