

Project number: 6491
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Calving date and breed impacts on grazing system performance on a wetland soil



Key external stakeholders:

BMW region dairy farmers
Local milk processors – Lactpatrick Co-op, Lakeland Dairies and Aurivo Co-op
AI companies
Consultancy agencies

Practical implications for stakeholders:

The experiments undertaken within this project provide a benchmark for productivity and profitability for dairy farmers in comparison with the prevailing low levels of productivity per hectare on commercial farms in the BMW region.

Main results:

Within the intensive production systems evaluated in this experiment

- altering mean herd CD had no effect on pasture productivity, sward chemical composition or grazing efficiency
- delaying CD reduced the requirement for concentrate supplementation but had no effect on total lactation milk production and reproductive performance
- there was also no interaction of CD and BG observed for any of the parameters.
- The HF breed group achieved a greater cumulative lactation milk yield and reduced milk fat and protein constituents compared with JFX and therefore MS production per cow was the same for both breeds.

Opportunity / Benefit:

The various experiments undertaken evaluated the potential for dairy farms to expand production in a biologically and economically efficient manner using alternative farm systems through alternative stocking rate, breed groups and calving date combinations within an integrated whole farm systems framework.

Collaborating Institutions:

UCD

Teagasc project team:	Dr. Brendan Horan (PI) Dr. Donal Patton
External collaborators:	Dr. Karina Pierce, University College Dublin Allo Duffy, Lakeland Dairies Norman Witherow, Donegal Co-operative Society Aidan McCabe, Lactpatrick Co-operative Society Phillip Doonan, Aurivo Co-operative Society Trevor Dunwoody, Teagasc Advisory, Monaghan

1. Project background:

Among the main avenues to increase productivity on pasture-based farms, the identification of the optimum calving date (**CD**) and stocking rate (**SR**) combination is of foremost importance. The Border, Midland & Western region of Ireland (BMW) comprises thirteen counties including the six border counties with Northern Ireland and accounts for 47% of national land area. Notwithstanding its scale, the region currently accounts for only 25% of total national milk production. From an agronomic perspective, the wet mineral soils, which are characteristic of the region, impede drainage and result in a shorter grazing season and lower pasture production compared to the south of Ireland. In the BMW region, the profile of grass growth differs considerably to drier southern soils and so a different combination of SR and CD maybe appropriate to maximise pasture utilisation and ultimately farm profitability in the region.

2. Questions addressed by the project:

The aims of this project are to evaluate the effects of animal genotype and herd mean calving date on grass production and utilisation and milk production. The results of this project should provide enhanced information on the optimum calving date and management strategy best suited to high productivity pasture-based milk production within the BMW region; further enhance our understanding of the relationship between intensification at farm level and animal type in terms of lactation milk production and feed utilisation and provide additional information that can facilitate the development of a more profitable and sustainable dairy industry.

3. The experimental studies:

A total of 146 spring-calving dairy cows, comprised of 2 BG (Holstein-Friesian and Holstein-Friesian Jersey crossbreds) were randomly assigned within BG, to one of two mean CD groups established from within the existing research herd at Ballyhaise Agricultural College, Co. Cavan (Teagasc, Ireland). Animals were assigned either to an early calving (mean CD: February 23) treatment or a late calving (mean CD: March 11) treatment designed to represent 2 alternative whole farm CD options for compact spring calving. The effects of CD, BG and their interactions on milk production, BW and BCS were analysed.

4. Main results:

Within the intensive production systems evaluated in this experiment, altering mean herd CD had no effect on pasture productivity, sward chemical composition or grazing efficiency. Although delaying CD reduced the requirement for concentrate supplementation, CD had no effect on total lactation milk production and reproductive performance and there was also no interaction of CD and BG observed for any of the parameters evaluated. Breed group had a significant effect on milk production. The HF group achieved a greater cumulative lactation milk yield ($P = 0.06$; 4,886 kg/cow) but reduced milk fat and protein constituents (46.5 and 36.1 g/kg respectively) compared with JFX (4,691 kg/cow, 48.6 and 37.5 g/kg, respectively). Within the range of treatments evaluated using high EBI dairy cattle, the results of this study indicate that within compact spring calving systems, choice of CD and BG group had minimal effect on pasture and animal performance on a wetland drumlin soil.

5. Opportunity/Benefit:

The high SR and early CD tested within this study are more intensive and earlier than those used in commercial practice in milk production systems in Ireland and provide an insight into the productivity of such systems ahead of industry uptake. The overall level of productive and reproductive performance within the current study compares favorably with current national industry statistics. Consequently, these results indicate that the selection of high genetic potential dairy cattle combined with improved grazing has the potential to considerably improve both productive efficiency and financial performance of commercial grass-based dairy farms.

6. Dissemination:

In addition to 3 open day events during the study, individual discussion groups frequently visited the experiment during the project. Topics covered at these events by research and advisory staff included grassland management best practice advice, animal breeding and health recommendations and economic implications of research results.

Main publications:

- Patton, D., Pierce, K. M. and Horan, B. 2016. Effect of stocking rate on milk and pasture productivity and supplementary feed use for spring calving pasture fed dairy systems. *Journal of Dairy Science* <http://dx.doi.org/10.3168/jds.2015-10305>.
- Patton, D., Shalloo, L., Pierce, K. M. and Horan, B. 2012. A biological and economic comparison of two pasture-based production systems on a wetland drumlin soil in the Northern Region of Ireland. *Journal of Dairy Science* 95: 484-495.

Popular publications:

Patton, D. Shalloo, L. and Horan, B. Key Grassland Targets and Appropriate Stocking Rates and Calving Dates for High Profit Grassland Systems. Positive Farmers Conference, 2016.

Patton, D. Appropriate Stocking Rates and Calving Dates for High Profit Grassland Systems. Teagasc National Dairy Conference, 2015.

Patton, D. Building your own Grass Budget. Irish Grassland Association Conference, 2015.

7. Compiled by: Brendan Horan & Donal Patton
