

Productivity, animal health and the environment

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This month, Finbar Mulligan, associate professor at the School of Veterinary Medicine, shares an update on the dairy nutrition research that is taking place at UCD Lyons Farm

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The production of milk and the sale of dairy products internationally is an extremely important part of the national economy. The agri-food and drink sector is estimated to be worth €13.6 billion to the Irish economy, accounting for 7.8% of gross national income and 7.9% of total employment. The dairy sector is estimated to be worth €4 billion to the Irish economy (Bord Bia, 2018) and it is a key contributor to the revenue of many farm-animal practices in Ireland. Recently, there has been a huge emphasis on expansion of Ireland's dairy exports. However, it is important that dairy production in Ireland is sustainable from an environmental point of view. With this in mind, many have pointed to the large increase (35%) in dairy cow numbers in Ireland since milk quota abolition as a significant contributor to our environmental footprint. Furthermore, since many farms in Ireland were traditionally small in size, many recently expanded herds don't have sufficient facilities or labour resources to deal with the increased cow numbers.

At UCD Lyons Farm, the largest dairy research project seeks to develop a grazing system for milk production that is based on a high level of output per cow, so that nationally we can increase milk output without the need for another large increase in dairy cow numbers. This project has many farmer visitors every year and gets much international attention.

SWARDS AND DIETS

The development of multispecies swards (swards including herbs, legumes and grasses) grazing systems

also has the potential to reduce the environmental footprint of milk production. These systems use less than half the amount of fertiliser nitrogen than traditional perennial ryegrass-based systems use. These swards are currently being investigated at UCD Lyons Farm to determine their usefulness for milk production and to evaluate their potential to increase the efficiency of nitrogen utilisation by the dairy cow. It is hoped by using strategies such as these, that the Irish dairy industry can improve its environmental sustainability.

From an animal health point of view, high-producing dairy cows are often fed diets that promote an acidic rumen environment, which has many reported negative consequences for dairy cow health and production. Acidic rumen environments happen in grazing cows (O'Grady et al, 2008) as well as in cows managed in confined systems all across the world. Research at UCD Lyons, is currently looking at states of rumen acidosis caused by feeding a grass-based diet and how they compare to states of rumen acidosis caused by feeding a high grain diet and non-acidosis diets. The hope is that we can develop more effective prevention strategies for these conditions and have a better understanding of the consequences, for improved dairy cow health and welfare.

Another significant health issue for high-yielding dairy cows can be negative energy balance in early lactation. This problem can sometimes be exacerbated by a low amount of grazed grass available on Irish farms in spring. In these circumstances, it may be appropriate to consider nutritional management by total mixed ration, indoors, in order to increase dry matter and energy intake. However, many aspects of this strategy need to be considered including its effectiveness for improving metabolic status, its impact on production and fertility and, of course, its cost. This issue is currently under investigation at UCD Lyons Farm.

MILK FAT

From a farmer point of view, milk revenue is still the single most important factor that influences dairy producer profitability. Dairy farmers are now paid for milk using the A + B - C system. With this payment system, milk protein and fat production are more important than milk volume for milk revenue. Milk-fat percentage has huge potential to be suboptimal during the period of peak milk production from April through to June. Some recent peer-reviewed research indicates that milk fat depression affects as many as 10% of Irish dairy herds (Carty et al, 2017). One research project running at Lyons Farm seeks to investigate the role of low rumen pH in milk fat depression. This research will be carried out using 'Rusitec', a simulated rumen fermentation system. None of the research work at Lyons could happen without the dedication of the postgraduate students. There are also many academic staff, technical staff, farm staff and support staff at Lyons Farm and in the School of Veterinary Medicine as well as in the School of Agriculture and Food Science that make a huge contribution to this research.

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FURTHER INFORMATION

<https://www.ucd.ie/agfood/about/lyonsresearchfarm/lyonsdairyherd/>

REFERENCES

Available on request