


Dairy nutrition research: low milk fat percentage

In association with 

Orla Neville's current research hopes to shed further light on the significant issue of milk fat depression and low milk fat percentage on Irish dairy farms

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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. 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. While a lot of research projects and extension programmes have concentrated on the more valuable milk protein component, not as much attention has focused on the still valuable milk fat component. Importantly, milk fat percentage has huge potential to be suboptimal during the period of peak milk production from April through to June. Some recent research peer-reviewed, which indicates that milk fat depression (bulk tank for milk fat below 3.3%, with a normal milk protein percentage) affects as many as 10% of Irish dairy herds. Furthermore, and possibly more significantly, it was found that close to 40% of herds had a bulk tank fat percentage of less than 3.6%, with a normal protein content (Carty *et*

al., 2017). If it is assumed that milk fat has a value of €3.31 per kg (the average for Lyons farm for 2018), this means that for a 100-cow dairy herd producing 28kg of milk on average in April and May, the cost of milk fat depression would equate to approximately €5,005. If a further two-month period, where milk fat is below 3.6% applies, the cost will rise to €8,337 or approximately €200 per ha. for a 100-cow farm at a stocking rate of 2.5 cows per ha. (these figures are in comparison to a herd where milk fat percentage is 4.2% on average for the period). Many people with higher output herds seem to have the view that low milk fat percentage is normal or acceptable. However, data from the high-output grazing herd at UCD Lyons farm indicates an average milk fat percentage of 4.09 for the period from 60-120 days in milk, which is the risk period for low milk fat percentage in a spring calving herd. In many cases, the problem of low milk fat percentage can be avoided. In the long-term, it is possible to greatly reduce this problem by correct breeding decisions. The main dietary cause of milk fat depression is the ingestion of high quantities of polyunsaturated fatty acids in a scenario where rumen pH is low. In the period of May through to June, the lipid content of grass increases significantly. Normally in the rumen of

the dairy cow, polyunsaturated fatty acids are biohydrogenated to saturated fatty acids. However, when rumen pH is low, a significant amount of these fatty acids are only partially biohydrogenated in the rumen. This change in fatty acid metabolism results in the production of milk fat depressing intermediates, most notably trans-10, cis-12 conjugated linoleic acid. Low rumen pH, which contributes to this problem, is very common in grazing cows. Research from UCD School of Veterinary Medicine has shown that approximately 50% of grazing cows have a rumen pH of 5.8 or less, which is low enough to cause milk fat depression (O'Grady *et al* 2008).

In 2018, Orla conducted a research project collecting grass samples, feed samples and farm management data from farms that had milk fat depression and farms that had acceptable milk fat percentage. The data from this exciting research project will become available soon, and Orla is looking forward to answering many important questions about the topic.

"Much of what we know about milk fat depression we know from research with confined herds. Its will be very valuable to have some data specific to grazing cows to determine if dietary risk factors for milk fat depression are similar to those for confined herds."

