Teagasc Grange – beef

Dairy-beef: producing an in-spec carcass sooner

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Improvements in age at slaughter, carcass traits and grassland nutrition are especially important to dairy-beef systems, as almost 60% of cattle processed in Irish meat plants originate from dairy herds.

Grass-based systems of beef production are the most financially sustainable due to their lower requirement for imported feed. However, not all beef animals are capable of producing in-spec carcasses at lower slaughter ages from a predominantly forage based diet.

Previous dairy-beef systems research at Teagasc Grange found that when managed within an optimised grass-based system, where 87% of lifetime feed requirements were produced from home-grown forage, beef x dairy steers could be slaughtered five months earlier than their national average contemporaries, at similar carcass weights.

Based on this experience, a new study was formed to explore the role of genetic selection for reduced age at slaughter and grassland nutrition in developing high carcass output beef systems that are financially and environmentally sustainable.

The male progeny of Holstein Friesian cows mated to Angus sires of divergent genetic potential for slaughter age or high-EBI Holstein Friesians sires were purchased at three weeks of age.

These three genetic groups were then assigned to concentrate management strategies, differing in concentrate supplementation during the first and second grazing seasons.

This was done to explore the role of strategic concentrate use as a means of reducing age at slaughter and to identify if there was an optimum way to manage animals of different genetic potential.

A range of standard animal measurements are undertaken including:

- Liveweight gain (fortnightly).
- Skeletal and linear measurements.
- Ultrasound muscle and fat depths.
- Carcass performance (weight, conformation and fat).
- Primal cut yield.

Invariably, cattle which can produce an in-spec carcass at a younger age have an accelerated growth ability. We want to understand how this growth is fuelled by measuring important traits such as grazing and rumination behaviour, grass dry matter intake and the substitution rate of concentrates on a grass-based diet.

Animals which excel within grass-based ruminant production systems generally have enhanced grazing behaviour and high voluntary intake of forage.

The contribution of these animal genetic groups to physical, financial and environmental farm system performance will be assessed over multiple years.

Given that there are a large number of dairy-beef systems differing in breed, gender, slaughter age and feeding practices, it is not possible to carry out animal and field experiments on each one.

For this reason, farm systems modelling is frequently used to assess the performance of alternative production systems.

In recent years, a dairy-beef systems model was developed at Teagasc Grange to quantify the physical and financial performance of alternative systems.

Current research aims to augment this model to permit the assessment of greenhouse gas (GHG) emissions performance and contribution to food security of alternative dairy-beef production systems.

In the case of assessing the contribution to food security, this entails a comparison of the quantity of 'human edible feed' fed to cattle (e.g grain in concentrate rations) and the quantity of beef produced.

Results highlight the importance of early slaughter in reducing GHG emissions.