Multi-species swards and slaughter age reduction

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Irish agriculture, including beef farming, has obligations under EU and national legislation to reduce greenhouse gas (GHG) emissions and losses of nitrogen (N) and other nutrients to the environment. The recent increase in farm input prices, especially fertiliser and feed costs, brings additional challenges. Consequently, low-cost efficient grass-based beef production is now more important than ever.

For many decades, perennial ryegrass has been the dominant, sometimes the only, constituent included in grass seed mixtures used to renew grassland. More recently, white clover is included.

Compared to 'grass'-based swards, Grange research has shown the capacity of white clover inclusion to fix atmospheric N, resulting in annual savings of chemical fertiliser, equivalent to 100-150kg N/ha, for beef cattle grazing systems.

There is now increasing interest in using 'multi-species' swards, which include grasses (perennial ryegrass and other grasses), legumes (white and red clover) and herbs/forbs (e.g chicory and plantain), to further exploit complementarity between pasture species.

For example, recent studies at Grange have found increases in annual herbage yield of up to 25% for multi-species swards compared to perennial ryegrass swards, especially so at lower fertiliser nitrogen inputs.

Multi-species swards may represent an opportunity to enhance the sustainability of beef production through more consistent pasture supply, increased nutritive value, anthelminthic properties, benefits in N-excretion, and ultimately, better animal performance.

When allied to lower fertiliser nitrogen inputs, the associated environmental footprint is potentially reduced; however, these characteristics need to be quantified for Irish production systems.

A source of inefficiency in beef cattle production systems is the failure to meet live weight targets throughout the animals' lifetime, resulting in animals being older at slaughter.

Consequently, lifetime production costs, which are mainly feed-related, and the associated environmental emissions, particularly methane and nitrogen, are increased.

Nationally, mean age at slaughter for late-maturing suckler-bred steers, the predominant breed type from the suckler herd, is 28-months, which is five months later than achieved in grass-based research systems and high-performing commercial farms.

Within beef production systems, older animals at slaughter are generally less profitable and have a substantially higher environmental footprint.

A challenge with younger slaughter ages on lower-cost grass-based systems is achieving adequate carcass fatness, which is currently a key market requirement, and attaining this fatness is especially demanding with late-maturing genotypes.

Thus, identifying late-maturing genotypes with greater genetic propensity for subcutaneous fat deposition leading to younger slaughter ages may be a strategy to circumvent this problem.

Taking these emerging demands, the objective of this research project is to assess the impact of pasture-type (grass-clover versus 'multi-species' grazing swards and silage), genetic divergence for fatness in late-maturing breeds, and slaughter age (19, 24 and 28 months), on the biological, financial and environmental performance of suckler weanling-to-beef production systems.