**A holistic approach to sustainability starts with youngstock**

Cows play a crucial role in ecosystems due to their ability to turn human inedible protein into human edible protein. Due to the ability of ruminants to digest fibre they can convert grassland or even byproducts into food for human consumption. Unfortunately, ruminants produce methane as a byproduct of fermentation and that has caused focus on reducing emissions. However, we can improve both efficiency and profitability whilst reducing carbon footprint, and that starts with youngstock in both dairy and beef systems.

Effective youngstock rearing can lead to an efficient and profitable cow that stays in the milking herd for longer, reducing emissions per kg of FPCM. This starts with achieving early and adequate intake of high-quality colostrum, followed by effective health protocols and elevated levels of milk feeding.

Early life nutrition can program the metabolism of the cow and determine lifetime productivity. Calves fed on an elevated plane of nutrition produce approximately 225kg more milk in their first lactation and conceive earlier, therefore had a lower age at first calving than those on a restricted plane of nutrition. This could lead to a 6% reduction in carbon footprint through reduced age at first calving (26 to 23 months) and increased first lactation milk yields (7.5%). Preweaning nutrition also impacted longevity of the cows with 20% vs. 7% remaining at 5th lactation for elevated vs. restricted plane of nutrition, respectively. This can further reduce carbon footprint by reducing replacement rates.

In dairy beef systems colostrum, quality of milk replacer and monitoring are key to growth and health of these animals which determines their success. Metabolic programming also occurs in beef animals when reared on elevated planes of nutrition where these animals grow better and have been shown to have lower treatment rates. Questions still remain to be answered around the effect on slaughter weights and carcass quality.

Once the calf is set up for life through effective rearing, we must look to sustainably feed that efficient animal so that they perform to the best of their programmed potential. Reduction in carbon emissions can be further achieved through precision balancing of diets (reducing waste and formulating for reduced methane emissions) and reviewing sources of raw materials that contribute to increased carbon footprint of feed.

A holistic approach to sustainability and carbon footprint is required to satisfy national inventory but also reduce footprint per kg of product. This is intrinsically linked with efficiency and productivity and starts with effective youngstock rearing and management.