Determining Emissions from Forages

Objective To define the carbon footprint of UK forages at the farm level. To include grazed grass, grass silage and maize silage.

Background The UK industry is lacking some of the necessary information to reduce the impact of agriculture on the environment. The Global Feed LCA Institute (GFLI) data base used by feed manufacturers to calculate the carbon footprint of concentrated feed does not extend to UK forages (data from Feedprint which is based mostly on figures corresponding to Dutch farming systems). As forage plays a significant part of the feed fed to cattle, this is a substantial amount of feed which is not being assessed accurately. With the move to incorporating the carbon footprint as an on-farm metric for governments to be able to assess the impact of an enterprise on the environment it is essential that the UK industry finds tools and methodologies to properly assess the emission factors of forages. This could ultimately lead to producing accurate values that can be employed into LCAs for the calculation of the carbon footprint of meat and milk.

Existing information

Wageningnen, Feedprint work (Vellinga *et al* Recent Advances in Animal Nutrition 2013 and other publications)

UK work; J. M. WILKINSON AND P. C. GARNSWORTHY, Journal of Agricultural Science (2017), 155, 334–347

Requirements of scoping document/literature review

- Research the data already in the public domain.
- Ascertain the values and methodologies the main farm carbon calculators in the UK currently use.
- Assess the methods used for the determination of the Carbon footprint values from existing feed databases.

The above should cover grass as grazed, grass silage and maize silage and include losses from harvesting and the clamp (boundaries of the exercise).

Variability in the UK as a result of crop, geography, fertilizer, first, second and, third cut, ploughing soil type etc.

- Where there are gaps, they should be highlighted.

This will set the scene for a follow-on larger project meeting the needs of the UK industry to be able to calculate an accurate carbon footprint for their production systems by the creation of a series of equations which calculate the emission factors of forages as g/kg Co2 eq. The equations can be loaded into ration programs, and available for the feed industry to use. Alternatively, the equations can be utilised separately, as part of stand-alone software for advisors to use when discussing C-footprint scores with farmer customers. Through NIR or traditional farm sample analysis to assess individual samples these could then be further fine-tuned for individual farms to more accurately assess the farm, carbon footprint LCA and assist in management changes to mitigate individual farm impact.