

# Synergies from co-digestion of grass silage with other feedstocks

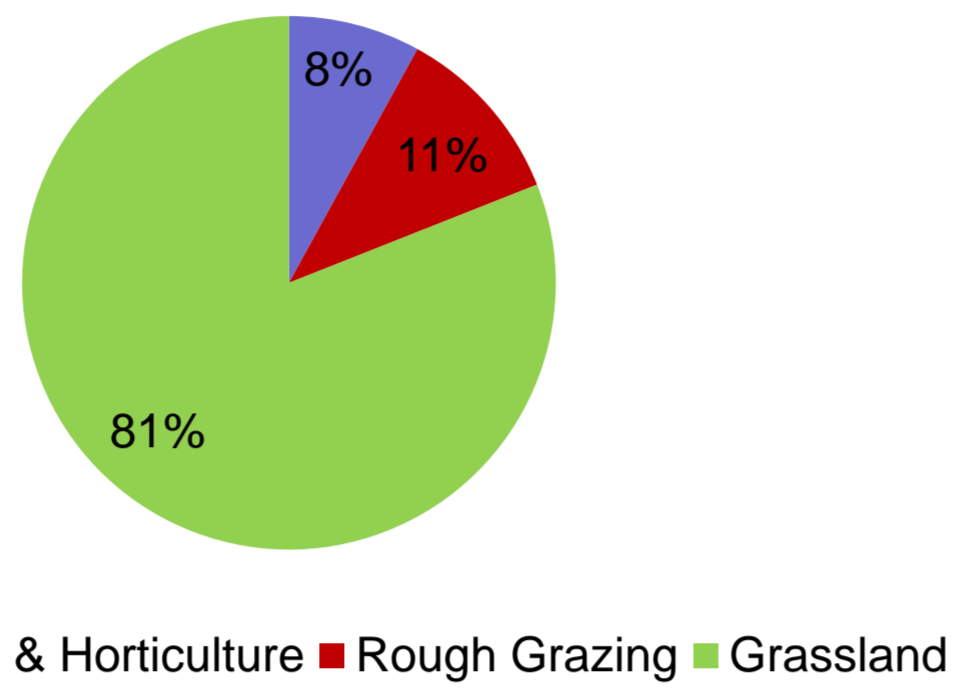
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## 1. Introduction

- Ireland has 4.2 million ha of agricultural land.
- 1.7 M t grass dry matter per annum (DM/a) is available in excess of livestock requirements (McEniry et al., 2013).
- This can be increased to 12.2 M t DM/a by more intensive grassland management (McEniry et al., 2013).
- 10% of the Ireland's grassland area could fuel up to 55% of all passenger cars with compressed biomethane (Wall et al, 2013).
- In 2010 there were 1.07 M dairy cows in Ireland. The slurry they produced during the 20 week winter storage can provide 7.07 M t DM/a (Wall et al., 2013).
- Long term mono-digestion of grass silage can suffer due to a deficiency in essential nutrients. Addition of slurry to grass silage can provide these essential nutrients.
- Co-digestion of silage and slurry may produce synergistic effects providing a higher biogas yield compared to mono-digestion of silage or slurry.

Ireland's agricultural land utilization

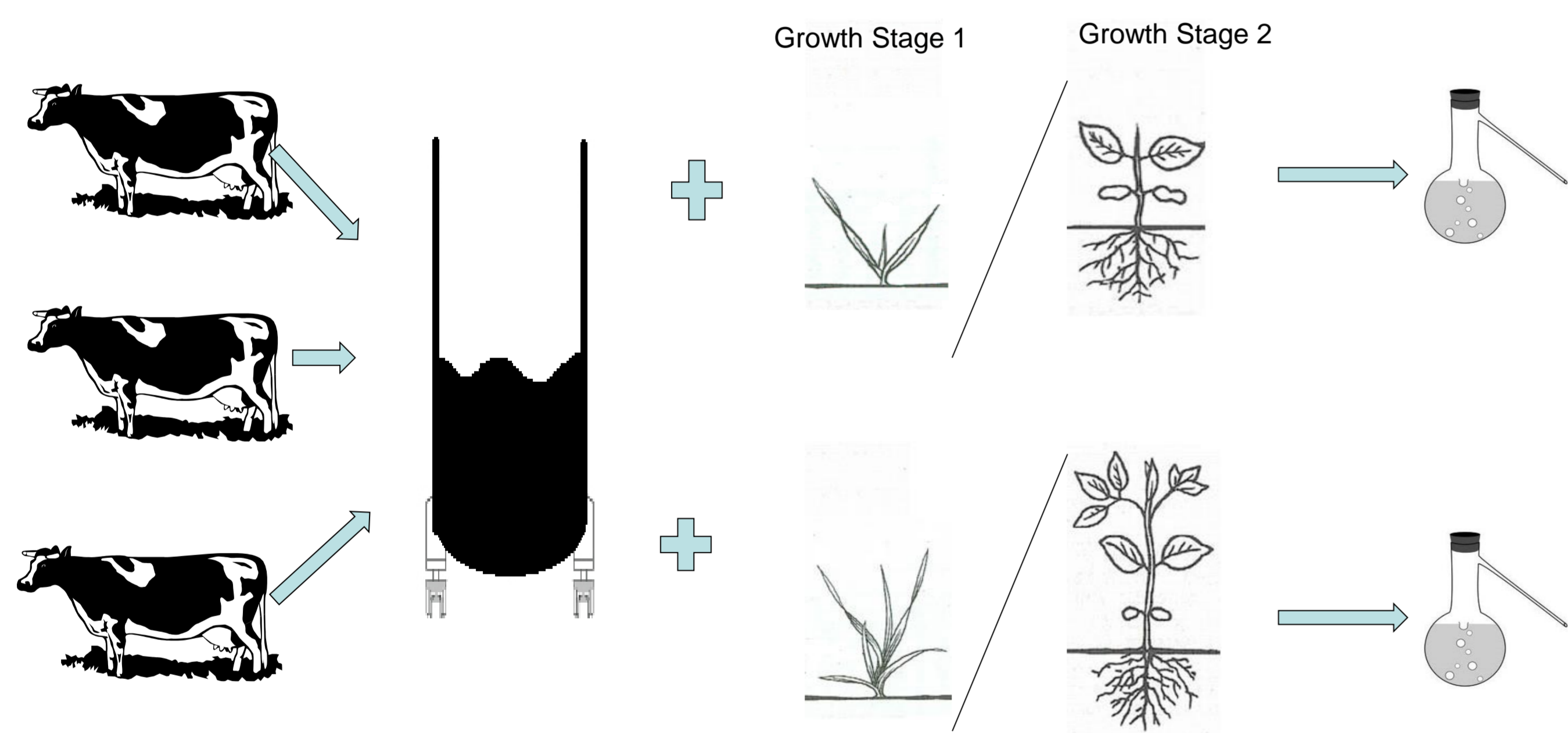


## 2. Objectives

- Identify the optimal crop growth stages to produce grass and legume silages, and the optimal mixture with cattle slurry, for biomethane production.
- Identify the optimal slurry type, and the optimal mixture with grass silages harvested at different growth stages, for biomethane production.
- Undertake a full inventory of a farm scale anaerobic digester producing biogas from grass silage and cattle slurry.

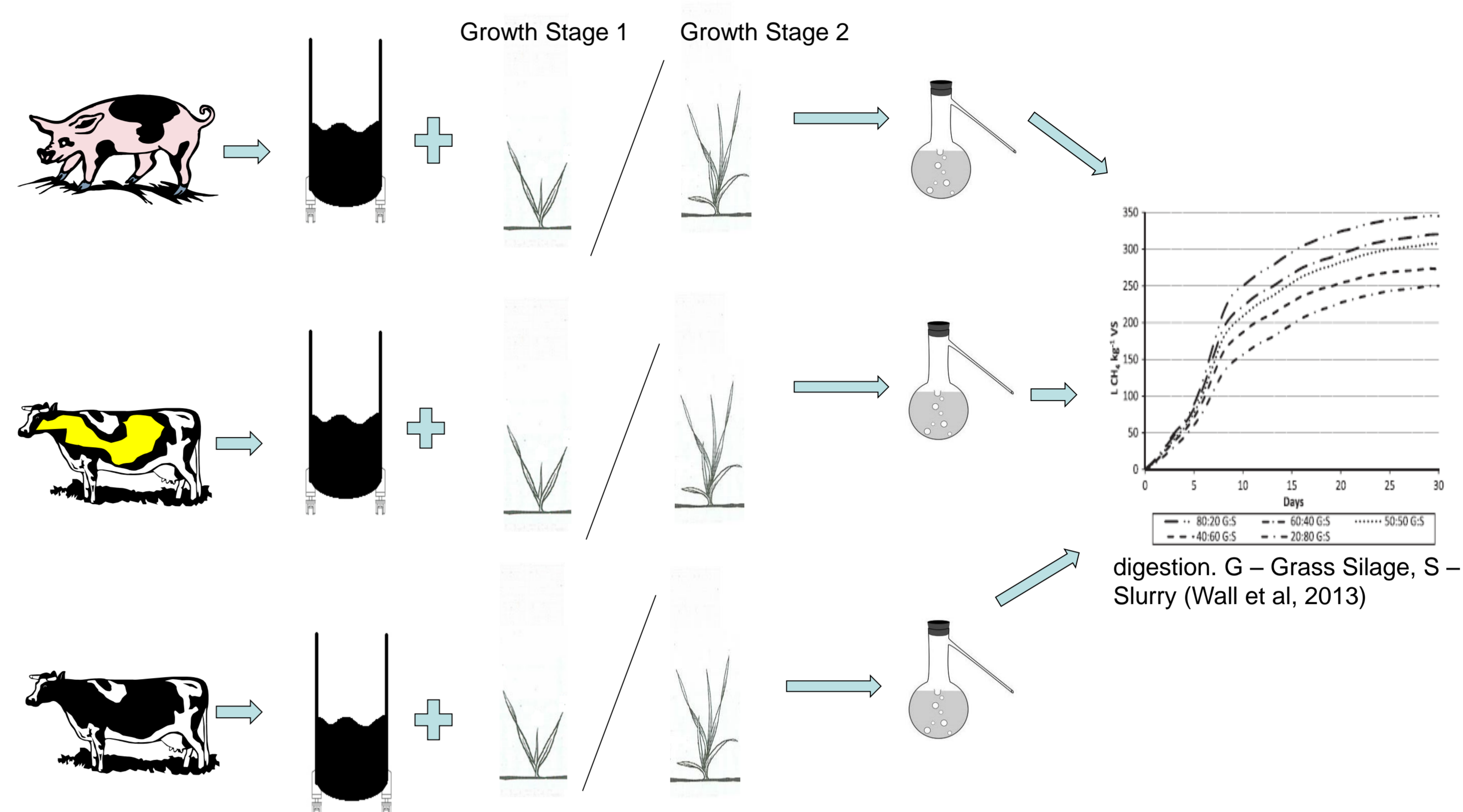
## 3. Co-digestion of grass and red clover silages of different growth stages with cattle slurry

### Materials & Method



## 4. Co-digestion of different slurry types with grass silage of different growth stages

- In-progress – Results would be available few weeks



## 5. LCA of anaerobic digester (to be built at Teagasc Grange)

- 150 kWe
- Grass silage and cattle slurry as feedstocks
- Similar to AD plant in Drumlee, Ballymoney, Northern Ireland



## 5. References

- McEniry, J.; Crosson, P.; Finnan, E.; McGee, M.; Keady, T.W.J.; O'Kiely, P. (2013) How much grassland biomass is available in Ireland in excess of livestock requirements? Irish Journal of Agricultural and Food Research 52
- Wall, D.M.; O'Kiely, P.; Murphy, J.D. (2013) The potential for biomethane from grass and slurry to satisfy renewable energy targets. Bioresource Technology 149: 425-431.

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