

SFF Participatory research

Background

Greenhouse gas (GHG) footprints for the farmlet systems were calculated for the 2019-2020 season. The GHG footprints cover all on-farm (milking platform, wintering block), youngstock and pre-farm gate biogenic GHG emissions, including CH₄ from enteric fermentation by ruminants, N₂O and CH₄ emissions from manure management and excreta deposition onto paddocks, and N₂O and CO₂ emissions from urea fertiliser application to land.

The pre-farm gate emissions relate to N fertiliser use for growing purchased supplements (baleage, barley grain and palm kernel expeller (PKE)) and have been included to ensure biological emissions associated with off-farm (and, in the case of PKE, off-country) production of supplements is accounted for in farm-scale footprint assessments.

Because the SDH farmlets include crop type (kale vs. fodder beet) as one of the main treatment effects, separate CH₄ emission factors were used for these two crop types.

Results

Across the four SDH farm systems and the four commercial farms that were studied there was a linear relationship between milk solids production/ha MP and methane (Figure 15) and nitrous oxide emissions

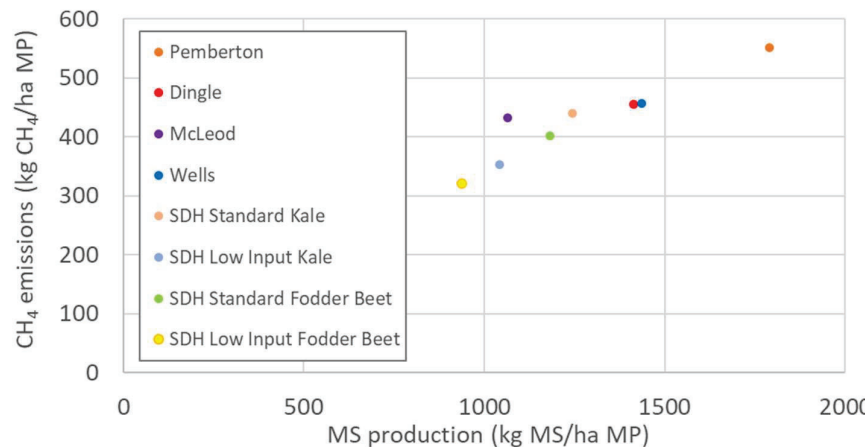


Figure 15: Relationship between milk solids production and methane emissions for the SDH farmlets & the Satellite Participatory Research farms

Key messages

- Reducing system intensity (N fertiliser inputs & stocking rate) had a much larger affect on GHG footprints than choice of crop type
 - The LI systems had 20% lower methane footprint and 35% lower long-lived gas footprint than the Standard farmlet systems.
 - The Fodder beet systems had a 9% lower methane footprint and 13% lower long-lived gas footprint than the Kale systems.
 - The reduced N inputs in the LI systems also resulted in a reduction in direct and indirect N₂O emissions from fertiliser use and from urine and dung deposition.
- GHG pricing based on the ETS 'back-stop' and the He Waka Eke Noa farm-level split-gas levy across the four farmlets ranged from \$41 to \$61/ha MP assuming a 95% discounted rate with He Waka Eke Noa.

Detailed results available in the March 2022 Field day handout.