Reducing the Carbon Footprint

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Agriculture and Food Development Authority

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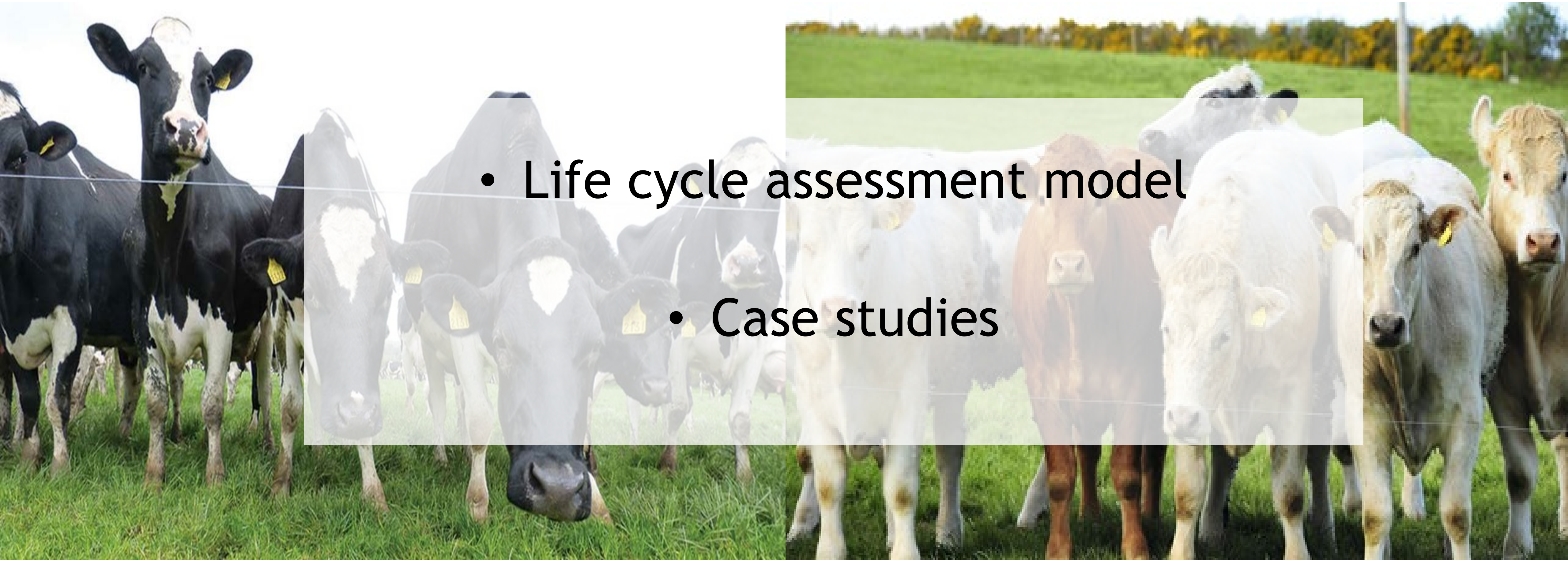
Overview



- Life cycle assessment model
- Case studies

Life cycle assessment (LCA)

Includes:

- Emissions released by on-farm processes
- Emissions released during the production of farm inputs

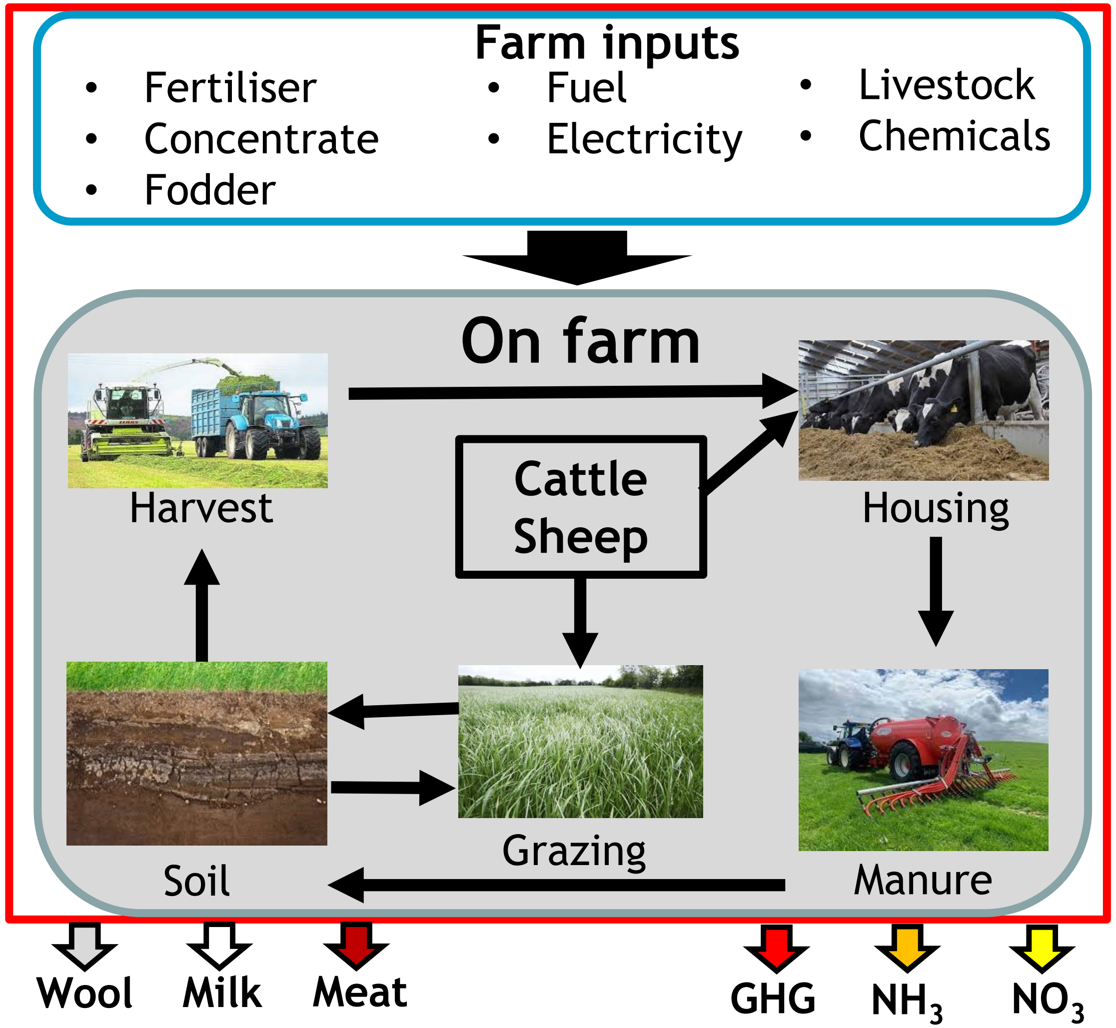
Boundary

- Cradle-to-farm gate

Unit

- Per kg live weight or carcass weight
- Per kg fat and protein corrected milk
- Per hectare

Global warming potential



Research updates

Intergovernmental Panel on Climate Change

WMO UNEP

2006 IPCC Guidelines for National Greenhouse Gas Inventories

Edited by Simon Eggleston, Leandro Buendia, Kyoko Miwa, Todd Ngara and Kiyoto Tanabe

IPCC National Greenhouse Gas Inventories Programme

IGES

ipcc
INTERGOVERNMENTAL PANEL ON climate change

2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories

Edited by Eduardo Calvo Buendia, Kiyoto Tanabe, Andrej Kranjc, Baasansuren Jamsranjav, Maya Fukuda, Sekai Ngarize, Akira Osako, Yurii Pyrozhenko, Pavel Shermanau and Sandro Federici

Task Force on National Greenhouse Gas Inventories

WHO UNEP

PROCEEDINGS No: 805

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International Fertiliser Society

THE CARBON FOOTPRINT OF FERTILISER PRODUCTION: REGIONAL REFERENCE VALUES

by

Antione Hoxha[1] and Bjarne Christensen[2]

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Proceedings 805

Paper presented to the International Fertiliser Society at a Conference in Prague, Czech Republic, on 8th May 2018.

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Science of the Total Environment 563–564 (2016) 576–586

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

Reducing nitrous oxide emissions by changing N fertiliser use from calcium ammonium nitrate (CAN) to urea based formulations

M.A. Harty [a,c], P.J. Forrestal [a], C.J. Watson [b,c], K.L. McGeough [b], R. Carolan [b], C. Elliot [c], D. Krol [a], R.J. Laughlin [b], K.G. Richards [a,*], G.J. Lanigan [a]

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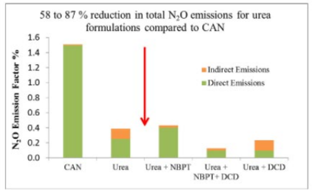
[b] Agri-Food and Biosciences Institute (AFBI), Newforge Lane, Belfast, BT9 5PX, Northern, Ireland

[c] School of Biological Sciences, Queen's University, University Road Belfast, BT7 1NN, Northern Ireland, United Kingdom

HIGHLIGHTS

- N_2O emission factor for CAN was higher than the IPCC default and variable between sites and years.
- Urea products decreased direct N_2O emissions from CAN on average by 80%.
- Switching from CAN to urea products reduces both N_2O emissions and fertiliser costs.

GRAPHICAL ABSTRACT



Science of the Total Environment 568 (2016) 327–338

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

Improving and disaggregating N_2O emission factors for ruminant excreta on temperate pasture soils

D.J. Krol [a,*], R. Carolan [b], E. Minet [a], K.L. McGeough [b], C.J. Watson [b], P.J. Forrestal [a], G.J. Lanigan [a,*], K.G. Richards [a]

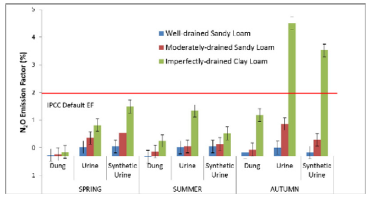
[a] Teagasc, Crops, Land Use and Environment Programme, Johnstown Castle, Co., Wexford, Ireland

[b] Agri-Food and Biosciences Institute (AFBI), Belfast BT9 5PX, Ireland

HIGHLIGHTS

- N_2O emissions were measured from cattle excreta applied to pasture.
- N_2O was universally higher from urine compared with dung.
- N_2O was driven by rainfall, temperature and soil moisture deficit.
- Emission factors were highest in autumn and from imperfectly-drained soil
- N_2O emission factors were lower than the 2% IPCC default value.

GRAPHICAL ABSTRACT



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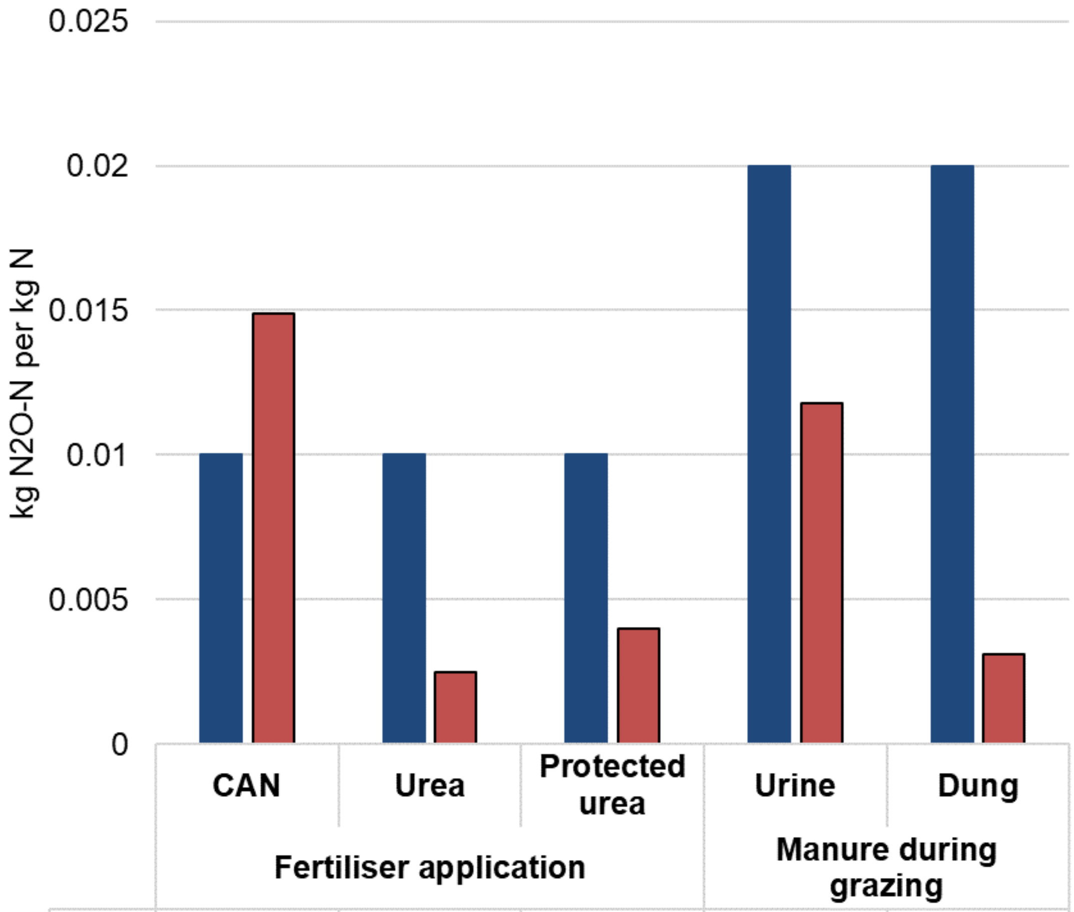
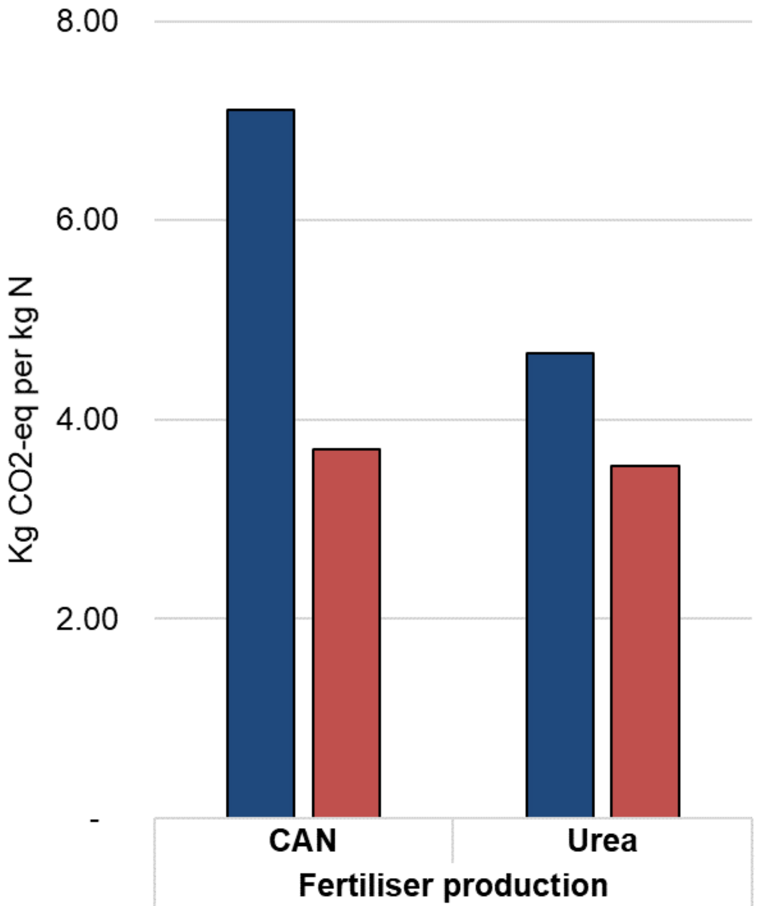
Research updates

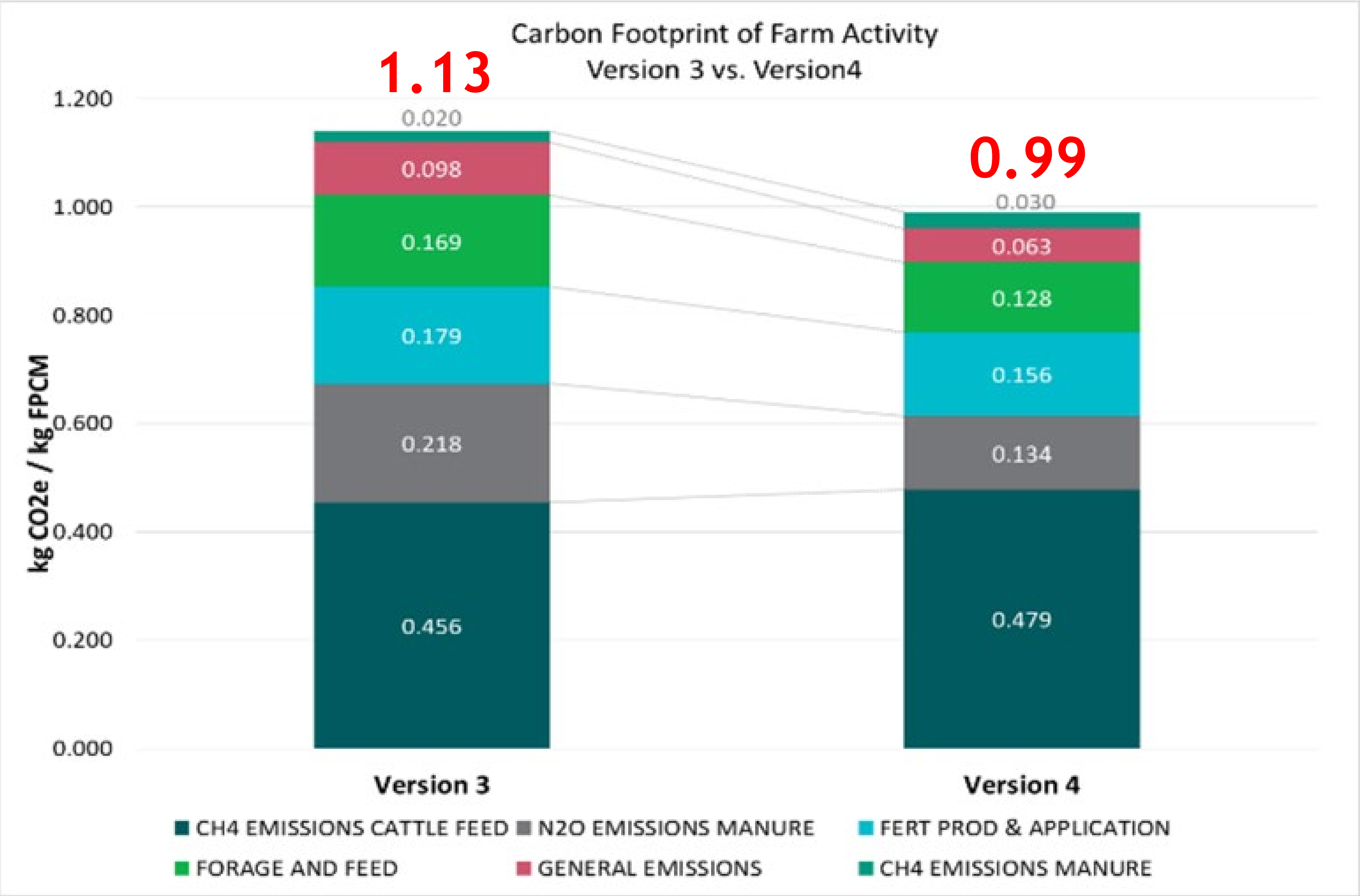


	Fertiliser application: CAN	Fertiliser application: Urea	Fertiliser application: Protected urea	Manure during grazing: Urine	Manure during grazing: Dung
Old	0.01	0.01	0.01	0.02	0.02
New	0.0149	0.0025	0.004	0.0118	0.0031



	Fertiliser production: CAN	Fertiliser production: Urea
Old	7.11	4.66
New	3.71	3.53

Updated Bord Bia carbon footprint



- Farming system have not changed
- Method of calculating has changed
  - Methane-ruminants
  - Manure
  - Fertiliser
  - Electricity

Will not be counted GHG reductions targets.

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Beef carbon footprint model

- Bord Bia SBLAS farmers can access their carbon footprint on-line
- Teagasc beef LCA models have been updated
- Bord Bia model currently using old version of model
- Process underway to update Bord Bia Model
- Updated model expected in a number of months




Mitigation strategies

- Footprint
  - Efficiency measures
  - Reduce footprint but could be associated with static or increased absolute emissions (e.g. genetics)
- Absolute emissions
  - Reduce total emissions
  - Footprint?
- Win/Win scenarios reduce footprint and absolute emissions

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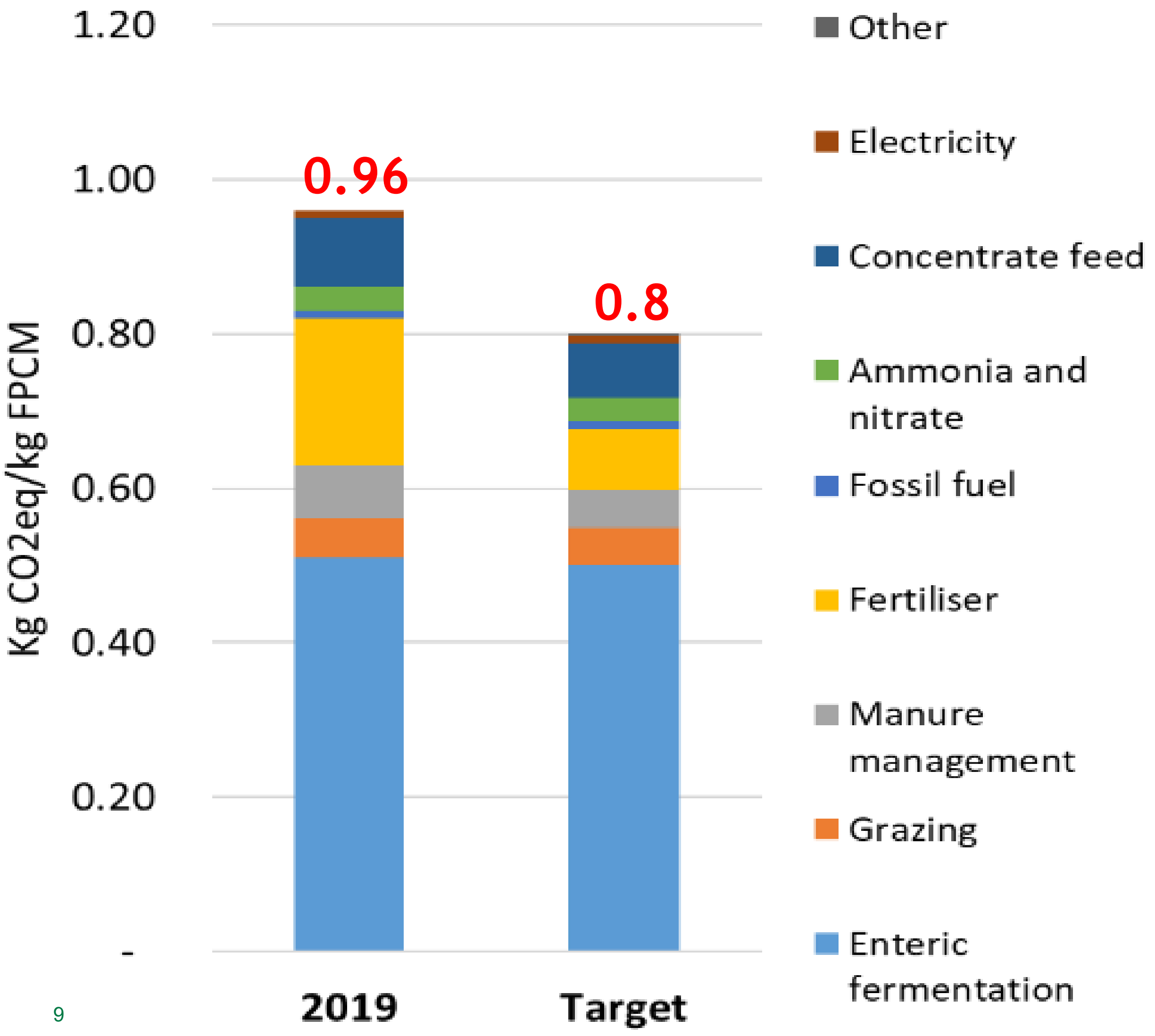
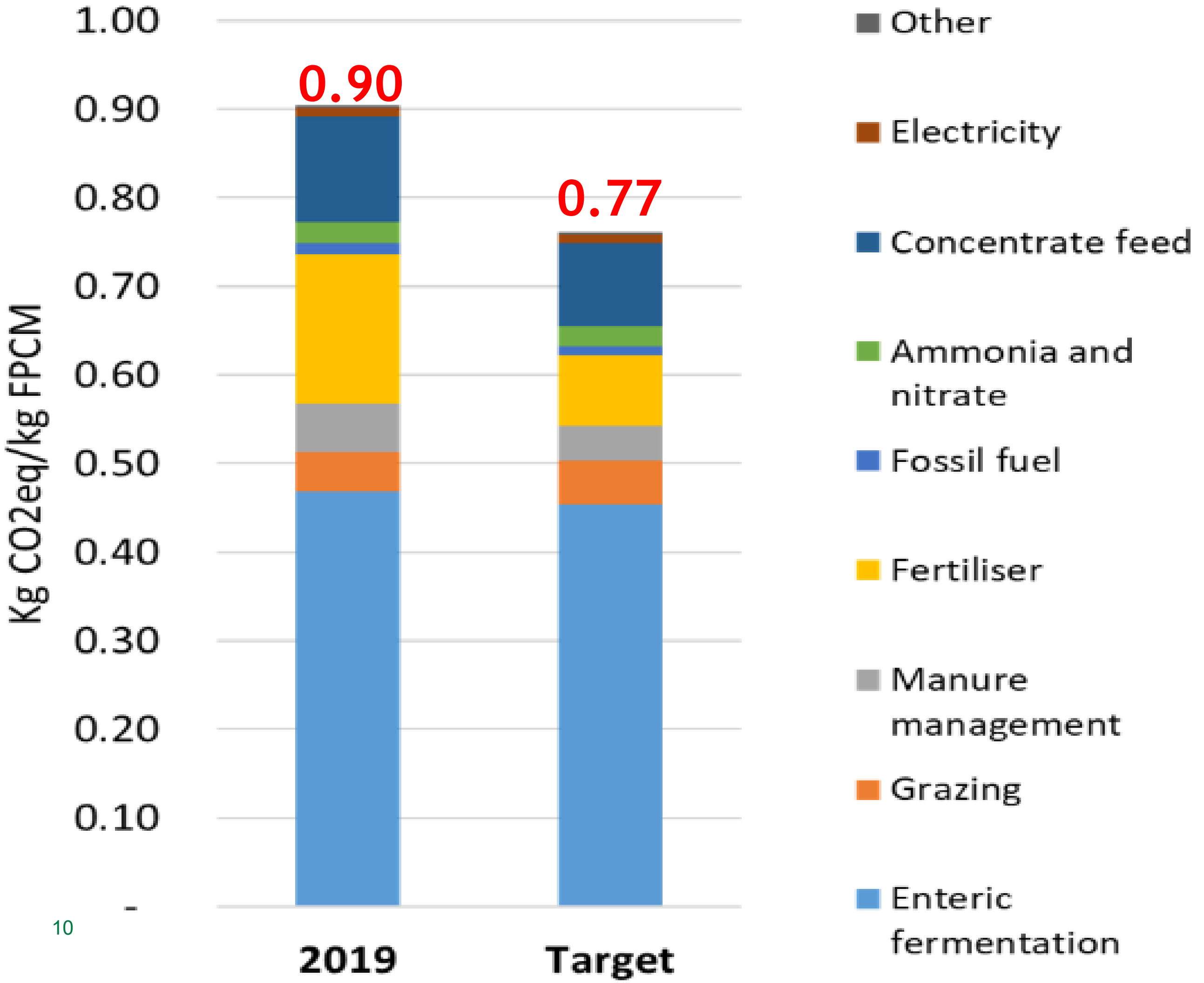
Signpost - Dairy farmer 1



	2019	Target
Milk solids (kg/cow)	515	540
Fertiliser (kg N/ha)	250	188
CAN (%)	71	-
Urea (%)	29	-
Protected urea (%)	-	100
LESS	50	100
Spring	50	70
Summer	25	30
Autumn	25	-
Turnout date	17 Mar	1 Mar
Concentrate (kg/cow)	935	785

Signpost - Dairy farmer 2



	2019	Target
Fertiliser (kg N/ha)	233	186
CAN (%)	100	0
Urea (%)	0	0
Protected urea (%)	0	100
LESS	100%	100%
Spring	80	80
Summer	0	20
Autumn	20	0
Turnout date	20 Apr	15 Mar
Concentrate (t/cow)	1250	1000

Summary

- Current solutions need to be adopted quickly
- Continue to focus on efficiency based measures
  - EBI, Health, productivity, feeding levels, CP%
- New solutions are being researched

Thank you for listening

Any questions?