

# Food and Agricultural Policies in Response to the Threat of Climate Change

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Burden of Disease Epidemiology, Equity  
and Cost Effectiveness Programme

Responding to climate change:  
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W E L L I N G T O N

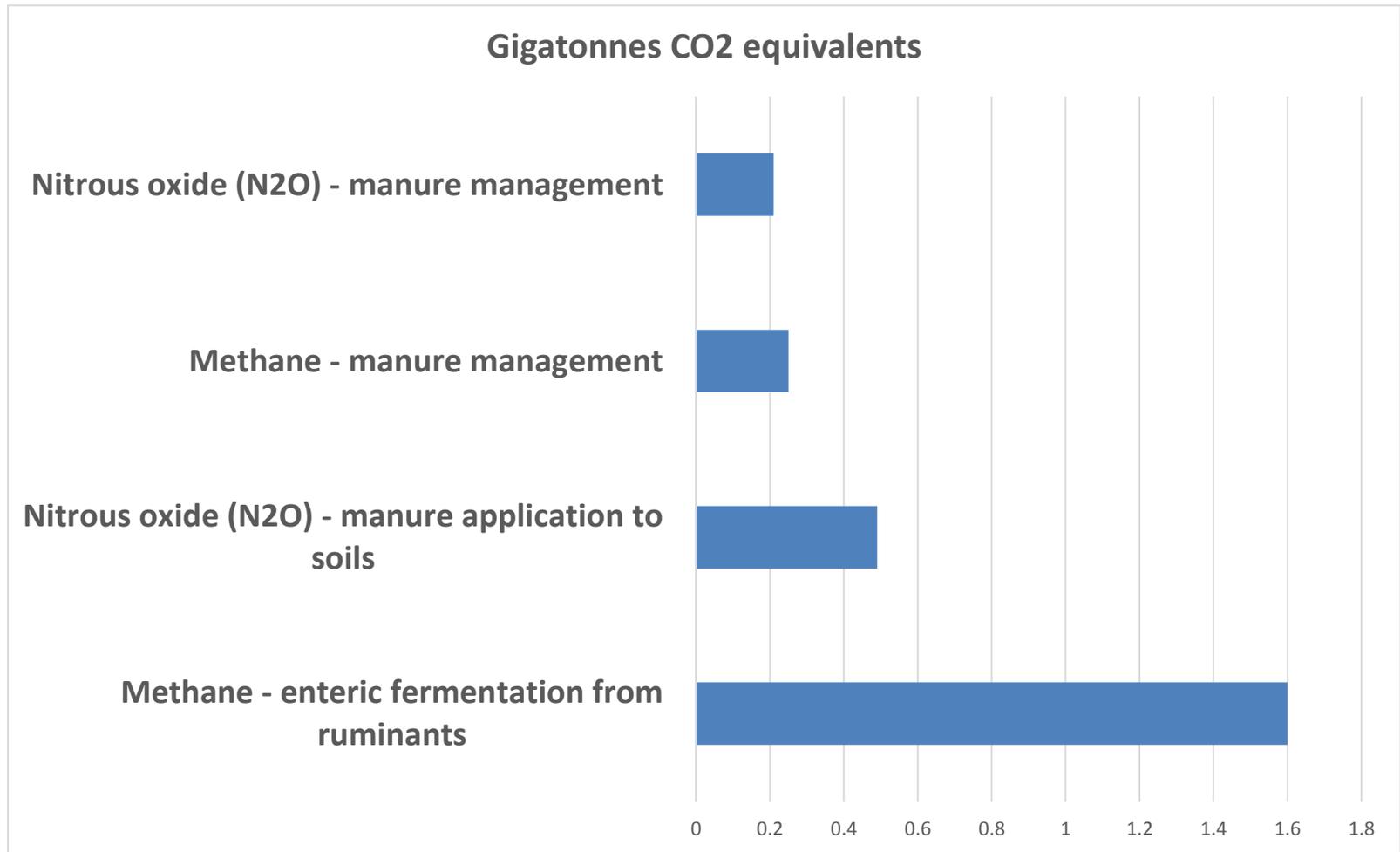
# Outline

- Role of food & agriculture in generating GHGs
- What international action is underway
- Potential interventions (theoretical)
- NZ situation & options
- Summary

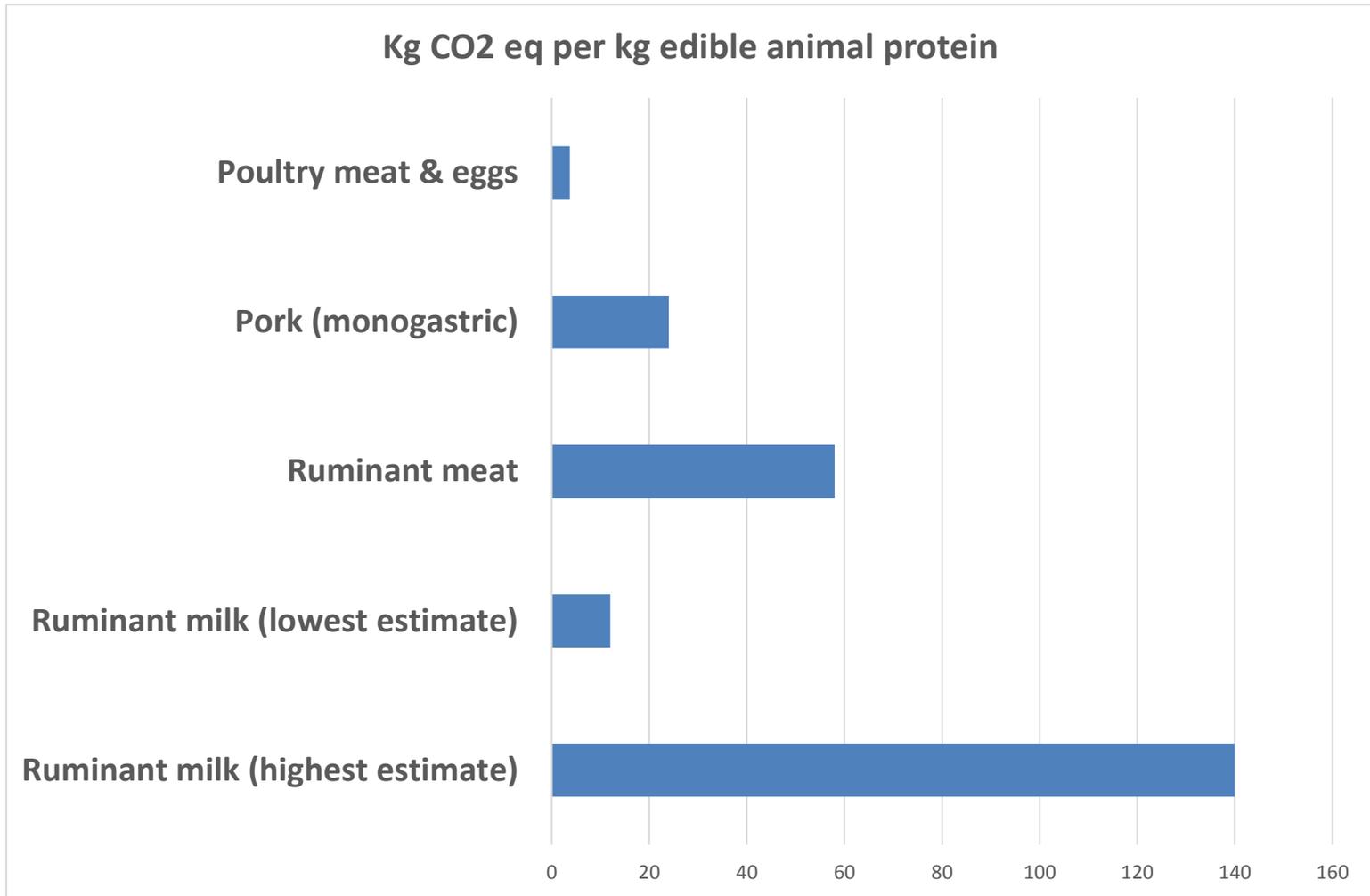
# Role of food & agriculture in generating GHGs

- Agriculture: 10% - 12% of total global GHG emissions. But up to 32% if land-use change is included. [IPCC 2007; Bellarby et al 2008]
- Livestock agriculture: 18% [FAO]
- Food chain in UK: 20% [WRAP 2007]

# Sources of livestock-related emissions [Herrero et al 2013]



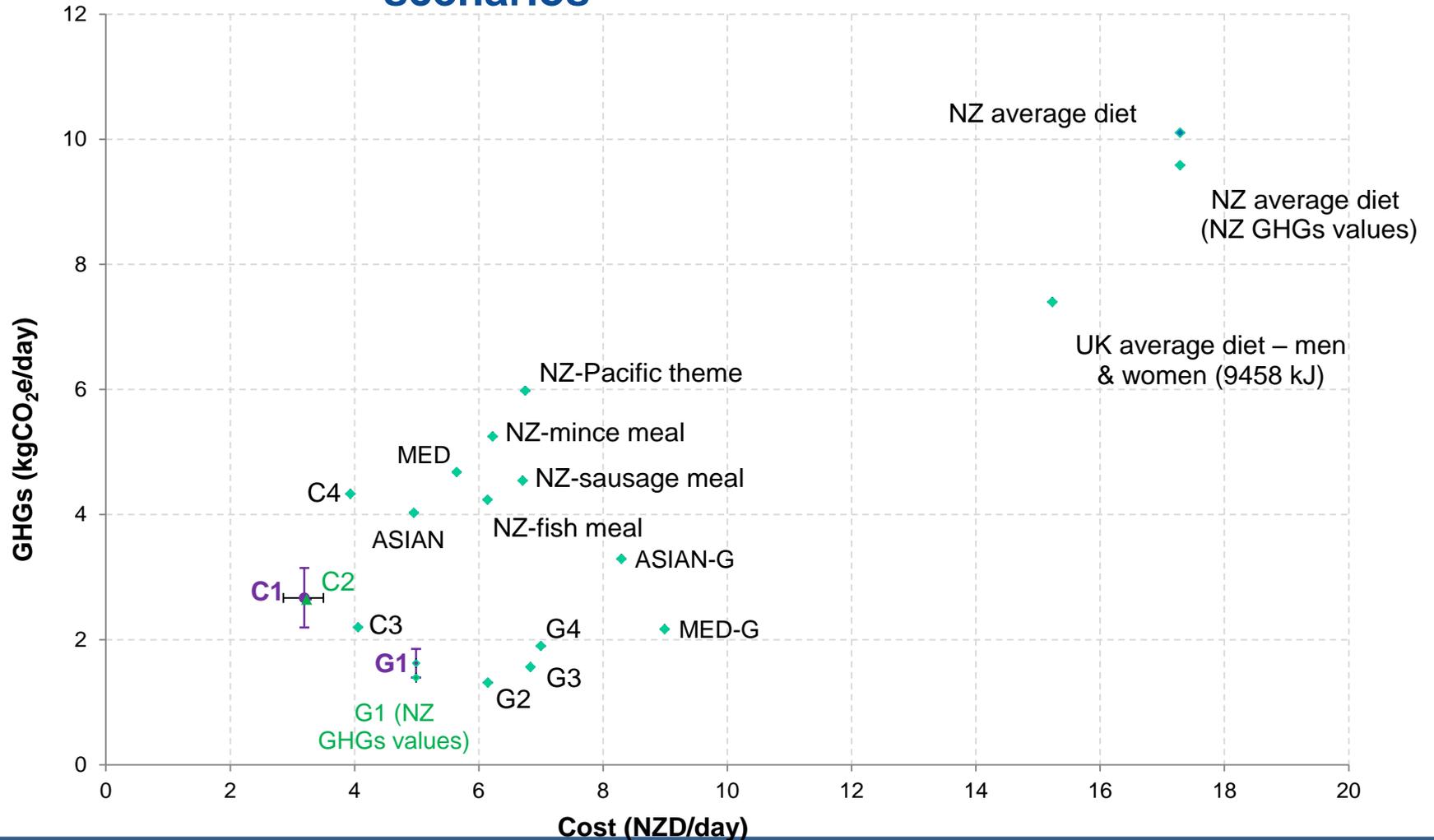
# GHG emissions by type of meat & milk [Herrero et al 2013]



# Dietary patterns & emissions

- Multiple modelling studies indicate: low meat/dairy diets → lower GHGs
- These diets → healthier & lower cost
- But:
  - Vegan not always optimal (some milk might be a more efficient micronutrient source)
  - Air freighted F&V: high GHGs

# NZ Study – Cost & GHG emissions per day of optimised daily dietary scenarios (Wilson et al 2013 PLoS ONE)



# Livestock sector (Herrero et al 2013, PNAS)

- Some food for 800 million food-insecure people, some income for 1.3 billion people

## ***But:***

- GHG emissions + ammonia + particulates
- Massive land use: 30% of world's ice-free surface
- Land degradation → soil loss, flood risk
- Water depletion: a third of the freshwater
- Water pollutants – nitrates, pathogens
- One-third of global cropland for livestock feed
- Misuse of antibiotics, potential source of pandemic influenza

# Policies around the world – fiscal

- Food taxes – GST/VAT, Denmark's saturated fat tax (withdrawn), but nil meat/dairy specific
- Nitrogen – fertiliser taxes & taxes on surplus nitrogen on farms (some European countries)
- Slow trend to removal of agricultural subsidies (water subsidies), & fossil fuel subsidies (still \$US 400+ billion)

# Actions internationally – farm level

[Johnston et al 2007; Kingston-Smith et al 2010]

- Animal feed (selective breeding & forage types) – key [Herrero et al 2013]
- Better matching of nitrogen additions to crops
- Manure management (eg, manure → digester → methane → energy)
- Reduced tillage, soil conservation – can trap methane

# Actions internationally – campaigns

- Some governments – guidelines on maximum red meat per day (eg, UK: 70g/d – “small chop”)
- Campaigns: “meatless Mondays” – some cities
- Food waste campaigns – evidence of success in UK
  - 13% reduction over 4 years
  - Still 20% food purchased is wasted (equivalent to the emissions of 1 in 5 cars on UK roads) (WRAP 2011)
- Organisational – NHS hospitals reducing meat in meals; this Summer School

# Potential interventions (theoretical)

- Taxes – meat/dairy prices. Modelling studies [Edjabou & Smed 2013; Briggs et al 2013] Eg, tax of £2.72/t CO<sub>2</sub>eq in UK:
  - Avert 7770 deaths/y
  - Reduce emissions by 19,000 ktCO<sub>2</sub>e/y
  - Raise revenue = £2.02 billion/y
- Such taxes – pork & poultry largely spared
- Option of promoting low-CH<sub>4</sub> meat products eg, kangaroo [Friel et al 2013]
- Green food labelling (eg, green stars)

# NZ situation – the good

- NZ relatively efficient food producer in terms of energy inputs [Saunders & Barber 2008]
- NZ advocates for removing agricultural & fossil fuel subsidies
- NZ contributes to international research (emissions reduction)

# NZ situation – problematic

- 47% of GHGs are agricultural but not covered in the Emissions Trading Scheme (ETS)
- ETS has failed to promote forestry conversion (also needed for flood control)
- Limited use of on-farm control measures
- Indirect subsidies via lack of water charging & for water pollution
- Very limited promotion of the health benefits of a shift to less red meat, less dairy (CVD, cancer)

# Options for NZ

- 1. *Keep pretending*** – to be responsible on GHGs (but: hard to fudge, not sustainable, not ethical)
- 2. *Makeup elsewhere*** – ignore agriculture & increase controls on industrial & home emissions (but: inefficient, unfair)
- 3. *Comprehensive policy*** – to addresses agricultural emissions (especially CH<sub>4</sub> tax or proper ETS)

# Summary

- Food & agricultural – substantial contribution to GHGs (~ 20%)
- Internationally – some successes with fiscal policies and campaigns, but major scope for more (eg, taxes on  $\text{CH}_4 + \text{NO}_x$  emissions).
- NZ – very limited & muddled policy responses, high risks of climate laggard status

