

## Sustainability

### Financial

- Profit
- Cash-flow
- Debt
- Rol

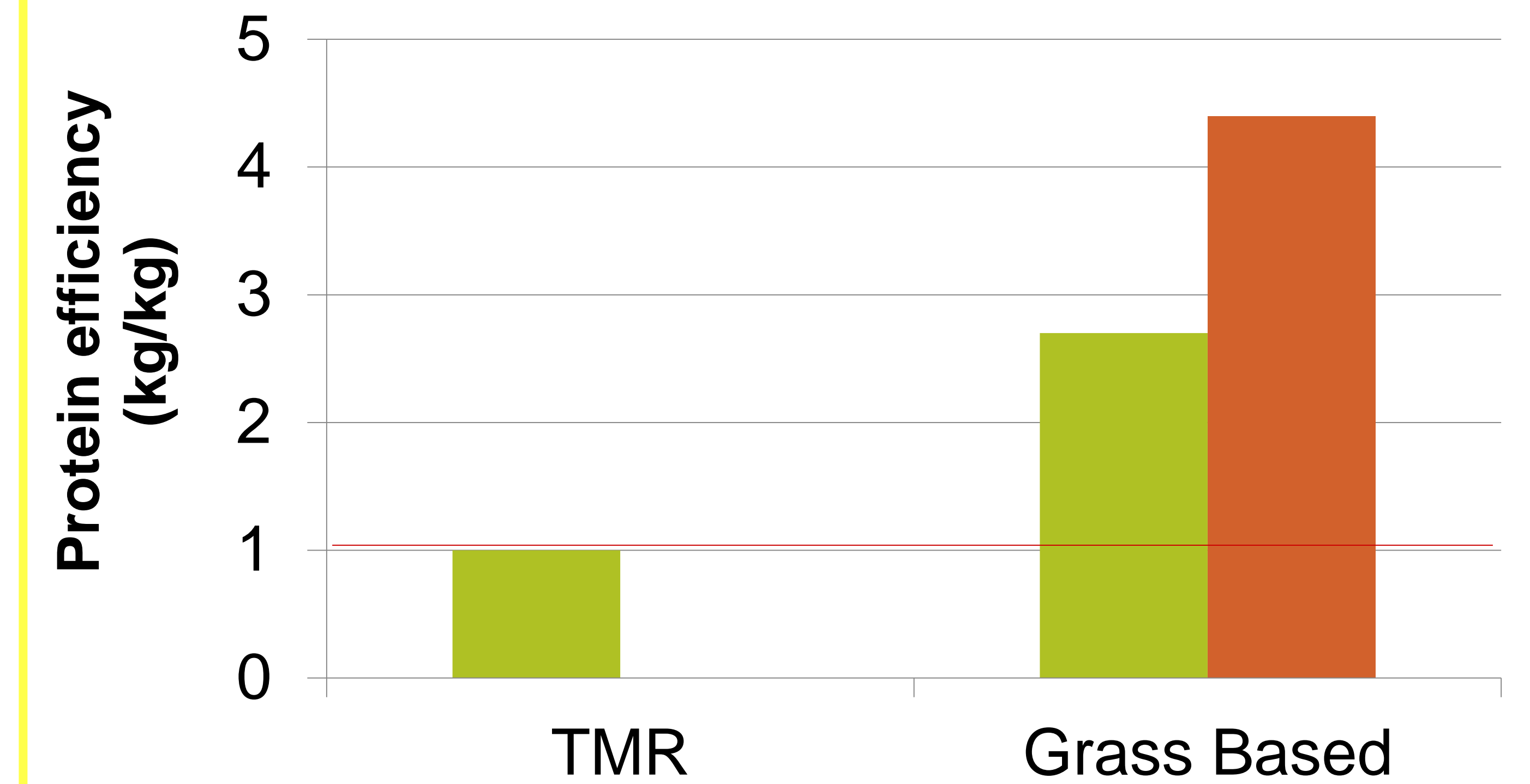
### Environmental

- Water quality
- Emissions – GHG, ammonia
- Biodiversity
- Water use

### Social

- Workload
- Succession
- Animal welfare
- Land use
- Dairy-beef

### Food security



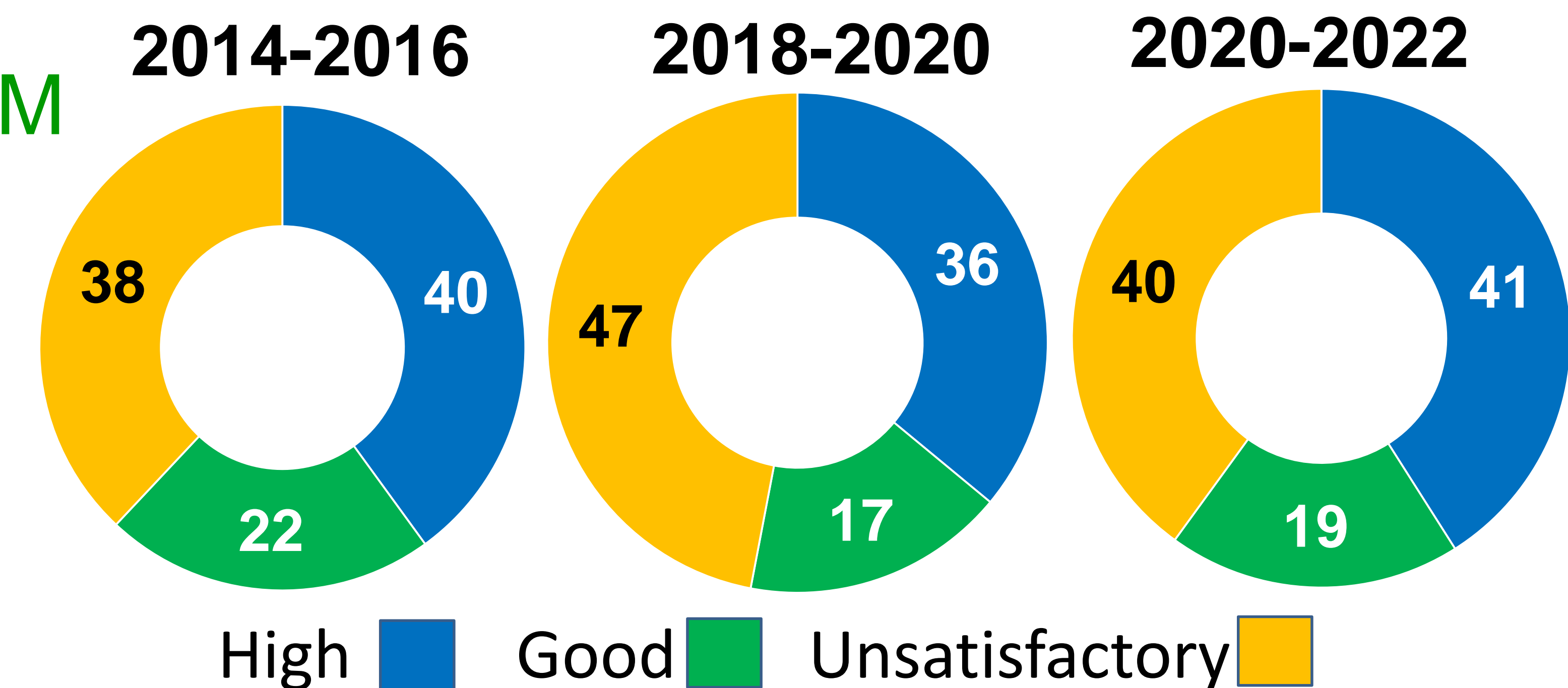
### Policy

- GHG emissions - 25% reduction; Climate neutral 2050
- Ammonia – 5% reduction 2030
- Nitrates Directive
- Biodiversity – targets for Nature Restoration Law under review
- Implications

### Current status

- GHG emissions
  - ❖ C footprint 0.88 kg CO<sub>2</sub>e/kg FPCM
  - ❖ Total Ag emissions
- Ammonia
- Water quality – EPA 2017, 2021, 2023

### River Nitrate Quality





# challenges

## Practices for today

- Reduce chemical N fertiliser
  - Soil fertility – 20% ➔ 100%
  - Strategic N fertiliser use
  - Manure management
  - Clover
- Protected urea – 14% ➔ 100%
- Animal breeding (EBI/sexed semen)
- Reduce conc. crude protein %
- Riparian margins
- Hedgerow management
- Age at slaughter
- Drain mineral soil



Farming for Water Quality



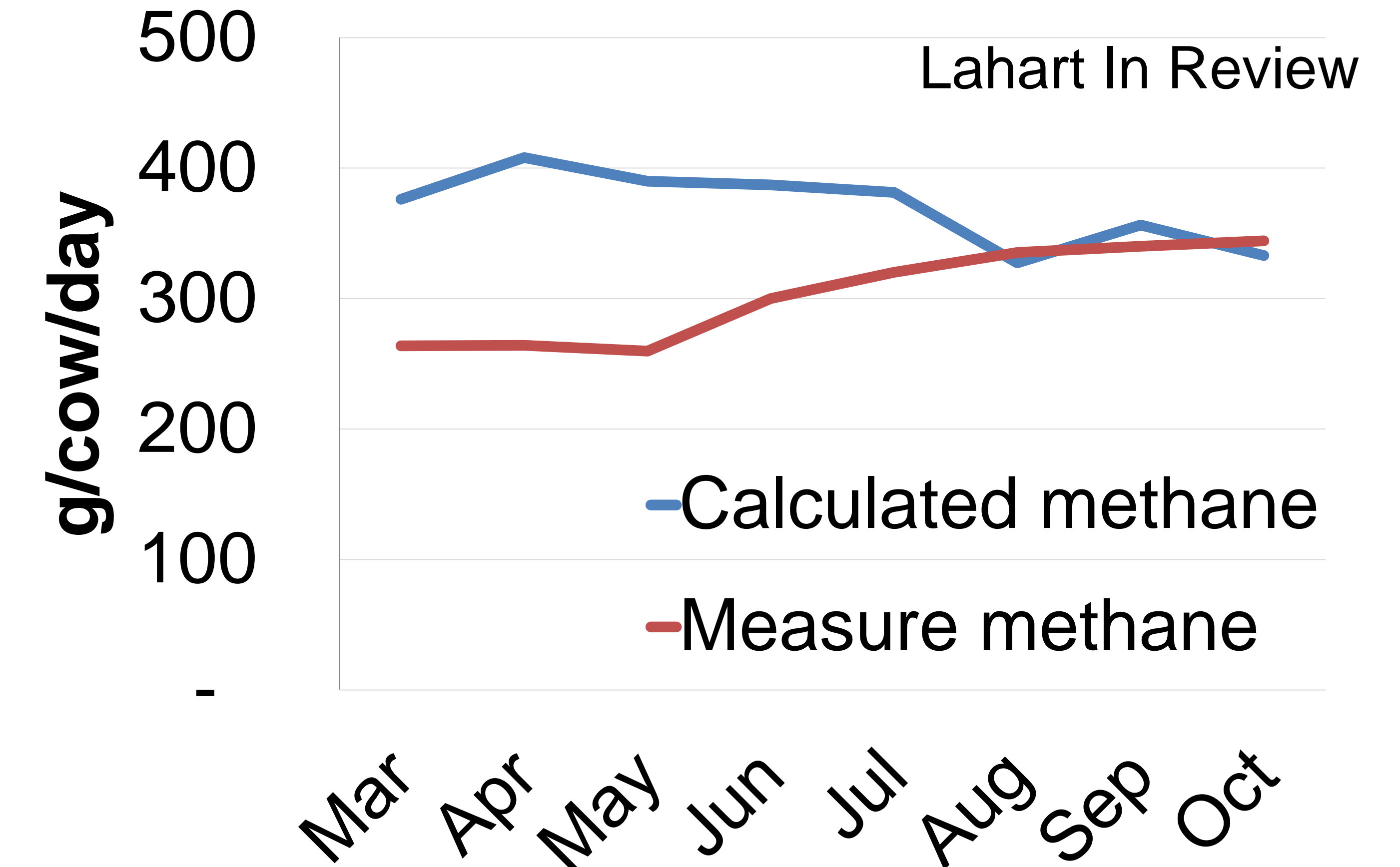
AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY



## Technologies for tomorrow

- Emission factors
  - Methane
    - Pasture
    - Grass silage
  - Soil carbon
  - Fertiliser
- Additives
- Manure
- Genetics & breeding

### Methane emission factors



## Other considerations

- Policy change
- Metric change
- Societal requirements
- People

## Take home messages

- Policy based on science
- Good metrics
- Implement practices
- New technologies