Global Methane Initiative/Climate and Clean Air Coalition

Agricultural Panel Discussion

29 March 2016, Washington

a CCAC supported project
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<thead>
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<th>Annotation</th>
</tr>
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<td>16:00</td>
<td>Welcome</td>
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| 16:00 – 16:20 | Introduction to livestock and methane       | Dr Theun Vellinga, Wageningen  
Dr Pierre Gerber, FAO |
| 16:20 – 16:30 | Mitigation of enteric fermentation                        | Dr Alex Hristov, Penn State University                                     |
| 16:30 – 16:45 | The Experience of Central America: how to mitigate emissions from enteric fermentation and manure in policy and practice? | Dr Mario Cobos, Colegio de Posgraduados, Mexico                           |
| 16:45 – 16:55 | The Experience of Vietnam: Improved Manure Management: combining biodigestion and utilization of bioslurry as a fertilizer | Mr Steven von Eije, SNV, Vietnam                                           |
| 17:00 – 17:45 | Discussion about potential of improvement of livestock production to contribute to SLCP reduction and co-benefits | Dr Pierre Gerber  
Dr Alex Hristov  
Dr Mario Cobos  
Mr Steven von Eije  
Dr Kahn Shahidul Huque  
Dr Christopher Voell (US EPA) |
Livestock, Enteric Fermentation and Manure Management Components

Livestock and short lived climate pollutants

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Theun Vellinga, Pierre Gerber

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Trends in animal product demand

Note: The Alexandratos & Bruinsma 2012 projections covered 2006-2050. Their trend result was carried forward here from the FAOStat actual data point for 2011.


WRI, 2015; based on FAO, 2015, and Alexandratos & Bruinsma, 2012
The “grand challenge”

Methane emissions

- The sector emits 3.1 Gt CO2-eq of CH4 per annum, or 44 percent of anthropogenic CH4 emissions
- 2.7 Gt for enteric methane only
  - 1.9 Gt from cattle (mostly from beef – 1.3 Gt)
  - 0.5 Gt from buffalo
  - 0.2 Gt from small ruminants
- 0.4 Gt for manure management
  - Mainly from liquid manure storages

Source: FAO - GLEAM 2013
A loss of energy

- enteric fermentation: equivalent to 144 Mt oil equivalent per year
- manure management: equivalent to 29 Mt oil equivalent per year

Source: FAO 2013
Manure management
A complete fertilizer

A source of raw materials

A source of energy

Organic substance
Primary macronutrients
Secondary macronutrients
Micro or trace elements

N
Nitrogen
Mg
Magnesium
P₀₂₆
Phosphate
S
Sulphur
K₂O
Potash
Ca
Calcium
Na
Sodium
Zn
Zinc
Fe
Iron
Cu
Copper
Mn
Manganese
Mo
Molybdenum
B
Boron

GLOBAL AGENDA

CLIMATE & CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS
Biogas production = mitigation?
Manure is a valuable resource
Pigs and poultry concentrations

Source: FAO - GLEAM 2013
Solving barriers in manure management

- **Awareness & knowledge**: development of a knowledge infrastructure for farmers, extension workers, private sector and policy makers
- **Coherent policies**: higher priority to fertiliser value, coherence between with other drivers: biogas, public health, pollution.
- **Credit facilities**: improve access to credits. Small investments can have a large impact.
- **Customised solutions**: simple facilities and equipment can be very effective
Enteric fermentation

DANGER CO$_2$W
Enteric methane emission

M.H. Deighton
Relative contribution of life-cycle phases
Global - cattle milk (l) and beef (r)

Source: FAO - GLEAM 2013
Regional variation in beef production and GHG emission intensities

Source: FAO - GLEAM 2013
What drives enteric methane emissions?

Average feed digestibility for dairy cattle

- Feed quality
- Animal productivity
- Herd structure
- Food waste
- Volume of production
What are the main available strategies for the reduction of enteric methane emission intensities?

- **Animal level: increased efficiency**
  - feed digestibility and balancing (range management)
  - feed additives
  - animal health
  - genetics (productivity and resilience traits)

- **Herd level: maintenance to production ratio**
  - age at first calving
  - replacement rates of milked animals
  - age at slaughter for male animals
  - semen sexing

- **No system change required**
- **Strong synergies with productivity gains, income and food security**
- **Strong synergy with natural resource use as a whole**
- **Need to be tailored and combined in view of specific farming systems, constraints and opportunities**
- **Need to be tested on the ground**
A strong link between methane emission Intensity and yield
Thank you
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