Low cost strategies to reduce enteric methane in dairy systems: Case studies from Ethiopia and Bangladesh

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Aimable UWIZEYE, PhD
Livestock Policy Officer
Animal Production and Health Division
Outline

• Methodology
• Dairy production systems
• Variations in GHG emission intensities
• Mitigation potential for enteric methane
• Key messages
Process for the identification of interventions

**Ethiopia interventions**

- **Supplementation**
  - (non conventional feed, concentrate and silage)
- **Supplementation**
  - (leguminous shrubs and fodder trees)
- **Supplementation**
  - (urea treated crop residues, Urea Molasses Multi-nutrient Blocks)
- **Establishment of fodder grasses and legumes**
- **Feed conservation** (silage)
  - **Disease control** (Trypanosomosis, East Coast Fever, parasitic worms)
  - **Use of superior genetics** (improved breeds)

**Bangladesh interventions**

- **Fodder cultivation**
- **Use of Urea Molasses Multi-nutrient Blocks**
- **Balanced feed ration**
- **Use of pre-partum balanced diets**
- **Mastitis prevention and control**
- **Deworming**
- **Heat stress management**

**List of parameters and quantified impacts**

- Consultation with experts to identify system specific interventions
- Literature review to provide evidence and data of impacts
- Model impact on emissions and emission intensities and productivity
- Select and design intervention packages and modelling of impact

**Quantified impacts**

- Emission reduction potential (kg CO₂ eq./kg FPCM)
- Productivity change (kg FPCM)
Ethiopia – Dairy production systems

Avg. ration digest.: 45%

Avg. ration digest.: 42.7%

Avg. ration digest.: 49%

Avg. ration digest.: 48.7%
Ethiopia - Baseline GHG emissions

Average GHG emission intensity per kg FPCM by dairy system

Relationship between milk production and emission intensity of milk

R² = 0.803

Rural mixed crop-livestock
Pastoral-agropastoral
Small-scale commercial
Ethiopia - Mitigation potential for enteric CH$_4$

Reduction of enteric CH$_4$ emission intensities by mitigation options from the baseline

Profitability for farmers: Benefit-cost ratio (BCR)
Bangladesh – Dairy production systems

<table>
<thead>
<tr>
<th></th>
<th>SUBSISTENCE (90%)</th>
<th>COMMERCIAL (10%)</th>
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</thead>
<tbody>
<tr>
<td><strong>Lactating cow</strong></td>
<td></td>
<td></td>
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<tr>
<td>Average digestibility of ration (%)</td>
<td>48.1</td>
<td>50.8</td>
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<tr>
<td>Non-lactating animals</td>
<td>44.9</td>
<td>46.8</td>
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</tbody>
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- **Subsistence**: 90%
- **Commercial**: 10%

- Fresh grass (natural, cut & carry)
- Cultivated grass
- Crop residues from rice & other cereals
- By-product from oil production from rape or canola
- By-product from paddy (rice polish)
- Pulse husk
- By-product from paddy (Broken rice)
- By-product from wheat (wheat bran)
Bangladesh – Baseline GHG emissions

Average GHG emission intensity per kg FPCM by dairy system

Relationship between milk production and emission intensity of milk

R² = 0.994

Commercial

Subsistence

kg CO2eq. per kg FPCM vs. kg CO2eq. per kg FPCM

kg FPCM per cow per year vs. kg CO2eq. per kg FPCM
Bangladesh – Mitigation potential for enteric \( \text{CH}_4 \)

**Reduction of enteric \( \text{CH}_4 \) emission intensities by mitigation options from the baseline**

**Profitability for farmers: Benefit-cost ratio (BCR)**

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Key messages

1. There are benefits of moving to a climate-resilient and low-carbon growth pathway for the dairy sector (productivity, profitability, nutrition, poverty reduction).

2. There is a need to adopt performance-enhancing technologies and use incentives to increase milk yields with net benefits in the short-to-medium term.

3. Mitigation of enteric methane plays an important role in food security and contributes to the achievement of the Paris Agreement and SDGs.

4. There is a need to enhance the access to climate finance and investments to address methane emissions in the dairy sector in Bangladesh and Ethiopia.
Aimable Uwizeye
Aimable.uwizeye@fao.org
Twitter @aimableuw

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