Assessing livestock systems – how indicators, system boundaries and methods may influence results

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A 100g protein

<table>
<thead>
<tr>
<th>Protein Type</th>
<th>GHG Emissions (kg CO₂eq)</th>
<th>Land Use (m²/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef (beef herd) 724</td>
<td>0-25</td>
<td>10th Mean 20-50</td>
</tr>
<tr>
<td>Lamb &amp; Mutton 757</td>
<td>12-20</td>
<td>10th Mean 30-185</td>
</tr>
<tr>
<td>Beef (dairy herd) 490</td>
<td>9.1-17</td>
<td>10th Mean 7.3-22</td>
</tr>
<tr>
<td>Crustaceans (farmed) 1.0k</td>
<td>5.4-18</td>
<td>10th Mean 0.4-2.0</td>
</tr>
<tr>
<td>Cheese 1.9k</td>
<td>5.1-11</td>
<td>10th Mean 4.4-41</td>
</tr>
<tr>
<td>Pig Meat 116</td>
<td>4.6-7.6</td>
<td>10th Mean 4.8-11</td>
</tr>
<tr>
<td>Fish (farmed) 612</td>
<td>2.5-6.0</td>
<td>10th Mean 0.4-3.7</td>
</tr>
<tr>
<td>Poultry Meat 326</td>
<td>2.4-5.7</td>
<td>10th Mean 3.8-7.1</td>
</tr>
<tr>
<td>Eggs 100</td>
<td>2.6-4.2</td>
<td>10th Mean 4.0-5.7</td>
</tr>
<tr>
<td>Tofu 354</td>
<td>1.0-2.0</td>
<td>10th Mean 1.1-2.2</td>
</tr>
<tr>
<td>Groundnuts 100</td>
<td>0.6-1.2</td>
<td>10th Mean 1.8-3.5</td>
</tr>
<tr>
<td>Other Pulses 115</td>
<td>0.5-0.8</td>
<td>10th Mean 4.6-7.3</td>
</tr>
<tr>
<td>Peas 438</td>
<td>0.3-0.4</td>
<td>10th Mean 1.2-3.4</td>
</tr>
<tr>
<td>Nuts 199</td>
<td>-2.2-0.3</td>
<td>10th Mean 2.7-7.9</td>
</tr>
<tr>
<td>Grains 23k</td>
<td>1.0-2.7</td>
<td>10th Mean 1.7-4.6</td>
</tr>
</tbody>
</table>

Poore and Nemecek, 2018
Fig. 2. Estimated emissions (kg CO$_2$-e kg CW$^{-1}$) for each finishing strategy – feedlot (FL) and adaptive multi-paddock (AMP) grazing – before (left) and after (right) net C flux from soils (sequestration and erosion) is incorporated.
Fig. 1 Corresponding climate impacts of a increasing, b constant, and c decreasing carbon dioxide and methane emissions (adopted of Allen et al. (2017))
Can we agree on something?

- The LCA calculations are correct
- Good grassland management
- Increase the number of lactations

- Choice of species?
- Production from grass: milk or meat?
Schematic representation of emission intensity distribution and emission intensity gap, for a given commodity, within a region, climate zone and farming system.
Figure 3 Considered scenarios in the modelling (DU = dairy cow production unit; SU = suckler cow production unit – see Figure 1).
• Search for the big leverage points
• Search for the big leverage points

• Make the food system smaller
• Search for the big leverage points

• Make the food system smaller

• Focus on N flows
• Search for the big leverage points

• Make the food system smaller

• Focus on N flows

• Develop policies at landscape level
• Search for the big leverage points

• Make the food system smaller

• Focus on N flows

• Develop policies at landscape level

• Reduce transaction costs/complexity by building on robust statistical findings
Contact

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