How much animal-source food can we produce while avoiding feed-food competition?

Hannah van Zanten
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## Demand for Animal Source Food

<table>
<thead>
<tr>
<th>Current</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>258 million ton</td>
<td>455 million ton (76%)</td>
</tr>
<tr>
<td>664 million ton</td>
<td>1077 million ton (62%)</td>
</tr>
</tbody>
</table>

Large impact on land use!
Feeding ‘leftover’ the solution?

- Co-products
- Waste products
- Marginal land

Avoiding feed-food competition
Direct competition

30% World grain production
40% World arable land
Indirect competition

Agricultural land: yes
Marginal land: no
Feed-food competition

Research question 1:
Are there livestock systems without feed-food competition?

- no method

Research question 2:
How much animal source food can we eat while avoiding feed-food competition?
Land use ratio

Van Zanten et al. (2016; IJLCA)

Land feed

\[ \text{Land feed} + \text{Land feed} + \text{Land feed} = \sum \text{HDP plant prod} \]

\[ \text{HDP kg from animal} \]

\[ \text{kg HDP plant prod} + \text{kg HDP plant prod} + \text{kg HDP plant prod} \]
Results

<1 animal production more efficient

Conclusion: livestock production can be more efficient than crop production

....... but systems should change
Feed sources for livestock: Recycling towards a green planet

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How much??

- Co-products
  - 14 g protein per day

- Food-waste
  - 3 to 7 g protein per day

- Marginal land
  - 21 g protein per day

60 g protein needed
Livestock important role in global food supply
Consuming small amount of animal source food most optimal from a land use perspective.
Hockey stick figure

- Production-side
  - Existing system
    - Intensification
      - Breeding strategies
      - Feeding strategies

Land use

% Consumption ASF
- Replace ruminant meat with monogastric meat
- Alternative protein sources
- Reduce consumption of animal source food
Land use

% Consumption ASF

Crop-residues
Biomass marginal land
Co-products
Food waste
Small consumption of animal source food is optimal but requires a paradigm shift of livestock production. Not increasing efficiency of the animal but increasing efficiency of the food system.

Not increasing efficiency of the animal but increasing efficiency of the food system.
Thank you

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Feed sources for livestock:
Recycling towards a green planet

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