Efficiency of Austrian dairy farms in terms of net food production and strategies for improvement

Paul Ertl, Wilhelm Knaus, Werner Zollitsch

(paul.ertl@boku.ac.at)
Which cow is more efficient?

<table>
<thead>
<tr>
<th>10,000 kg/y</th>
<th>5,000 kg/y</th>
</tr>
</thead>
<tbody>
<tr>
<td>↑ kg milk / cow space</td>
<td>↑ Milk per ha land</td>
</tr>
<tr>
<td>↓ Kg feed / kg milk</td>
<td>↑ Pasture (cheapest feed)</td>
</tr>
<tr>
<td>↓ CH₄ / kg milk</td>
<td>↑ Net food production?</td>
</tr>
<tr>
<td>↓ Fixed costs / kg milk</td>
<td></td>
</tr>
</tbody>
</table>
Net food production

~ 10%
(Cassidy et al., 2013)
Net food production

~ 10% (Cassidy et al., 2013)

up to 100%
Why worry?

Feeding the planet in 2050: with or without animal products?

Livestock And Feed Conversion: Food Producers Or Food Thieves?

U.S. could feed 800 million people with grain that livestock eat, Cornell ecologist advises animal scientists
Situation on Austrian dairy farms?

- Human-edible feed conversion efficiency (heFCE) (Wilkinson, 2011)

\[
\text{heFCE} = \frac{\text{Human–edible Output (animal product)}}{\text{Human–edible Input (feedstuffs)}}
\]

- 30 Austrian dairy farms
- For gross energy and crude protein
- On farm gate level
Calculation of human-edible Inputs

- Potential **edible fractions** based on literature
- 3 scenarios (low, medium, high)

- Examples for edible fractions:
  - Wheat: 60 – 100%
  - Sunflower cake: 14 – 46% (CP) / 20 – 30% (GE)
  - Dried distiller grains: 0%
heFCE for energy

Ø Scenario medium: 1.01

(Ertl et al., Agr Sys, 137:119-125; 2015)
heFCE for protein

Ø Scenario medium: 1.15

(Ertl et al., Agr Sys, 137:119-125; 2015)
Strategies for improvement

- heFCE = \( \frac{\text{Human–edible output (animal product)}}{\text{Human–edible input (feedstuffs)}} \)

- Increase output vs. decrease input!?
Take home messages

- Efficiency ≠ efficiency

- On average, dairy farms showed slightly positive heFCE

- Dairy farms as net contributors to human food supply
Questions?