Animal Feed vs. Human Food

Jude L. Capper, PhD

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1 in 8 Children are Hungry

Source: Created by [Author Name], 2013; Photo from: [Image URL]; Data from FAO (2012) "The State of Food Insecurity in the World". FAO, Rome, Italy.
1 in 8 Children are Hungry

Source: Created by Dr. Jude L. Capper, 2013; Photo from Dr. Jude L. Capper; Data from FAO (2012) “The State of Food Insecurity in the World”. FAO, Rome, Italy.
World Beef, Pork and Poultry Consumption:
1980 - 2050

Source: Created by Dr. Jude L. Capper, 2011; Data from: Global Insight Demand Analysis to 2050; Bauman and Capper (2011) Southwest Nutrition and Management Conference, Tempe, AZ.
The feed cost of an eight-ounce steak will fill 45 to 50 bowls with cooked cereal grains.
Are Cows Taking Food out of the Mouths of Hungry Children?

Source: Created by Dr. Jude L. Capper, 2013; Photo from: http://centralasiaonline.com/sharedImages/20150823/PakChildren.jpg
How Do We Define Feed Efficiency?

“Amount of feed required to produce a unit of weight gain, milk production, or dozen eggs.”

But are all “feeds” the same?

Source: Created by Dr. Jude L. Capper, 2013; Photo from Dr. Jude L. Capper
Feed Efficiency Ratios Vary Between Different Systems and Species

Feed Efficiency Ratio (lb input/lb output)

<table>
<thead>
<tr>
<th></th>
<th>Dairy</th>
<th>Suckler beef</th>
<th>Cereal beef</th>
<th>Pork</th>
<th>Poultry</th>
<th>Eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.1</td>
<td>27.5</td>
<td>7.8</td>
<td>3.6</td>
<td>2.0</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Source: Created by Dr. Jude L. Capper, 2012; Data from Wilkinson (2011) Re-defining efficiency of feed use by livestock. Animal.
Feed Efficiency Metrics Must Consider Competition for Human-Edible Foods

- **Grasses**: High non-human-edible proportion, low human-edible proportion.
- **Cereals/Pulses**: Moderate non-human-edible proportion, higher human-edible proportion.
- **Cereal B-Ps**: Lower non-human-edible proportion, higher human-edible proportion.
- **Soy Bean Meal**: High non-human-edible proportion, low human-edible proportion.
- **Oilseed Meals**: Moderate non-human-edible proportion, lower human-edible proportion.
- **Other B-Ps**: Lower non-human-edible proportion, lower human-edible proportion.
- **Vit/Min**: High non-human-edible proportion, low human-edible proportion.

Source: Created by Dr. Jude L. Capper, 2012; Data from Wilkinson (2011) Re-defining efficiency of feed use by livestock. *Animal*
Dairy Has Favorable Human-Edible Energy Input to Output Ratio

Source: Created by Dr. Jude L. Capper, 2012; Data from Wilkinson (2011) Re-defining efficiency of feed use by livestock. Animal.
Dairy and Beef Have Favorable Human-Edible Protein Input to Output Ratios

Source: Created by Dr. Jude L. Capper, 2012; Data from Wilkinson (2011) Re-defining efficiency of feed use by livestock. Animal.
What Do These Industries Have in Common?
They All Provide By-Products Fed to Animals

Source: Created by Dr. Jude L. Capper, 2013
Without Animal Agriculture, What Would Be the Carbon Cost of Sourcing Product Ingredients?
If You Can Grow Grass, You Can Grow Corn?
Turning Forages and By-Products That We Can’t Eat into Food... That’s Sustainability

Source: Created by Dr. Jude L. Capper, 2013; Photo from: http://centralasiainline.com/shared/images/2010/08/16/PakChildren.jpg
The Global Livestock Industry Is Under Threat

Fight Climate Change with Diet Change

ALL ANIMALS HAVE THE SAME PARTS

SOLVE 80% GLOBAL WARMING PROBLEMS

Source: Created by Dr. Jude L. Capper, 2011; Photos from: http://www.goveg.com/environment-globalwarming.asp
http://animals.change.org/blog/view/save_the_animals_save_the_planet_blog_action_day_09_climate_change:
http://www.peta.org/mc/ads/PAMPetsPETA300.jpg
FAO Data Implies Livestock Production is Unsustainable

“The livestock sector is a major player, responsible for 18 percent of greenhouse gas emissions measured in CO₂ equivalent. This is a higher share than transport.” – Livestock’s Long Shadow

Source: Created by Dr. Jude L. Capper, 2013

Did you know that farmed animals produce more greenhouse gas emissions (18%) than the world's entire transport system (13.5%)? Or that nitrous oxide from animal manure is around 300 times as damaging to the climate as carbon dioxide? Or that methane (cow and sheep farts/burps to you and me) has 23 times the global warming impact of carbon dioxide?

Makes you think doesn't it?
Animal Agriculture Contributes a Small Proportion of the US Carbon Footprint

According to the US EPA (2012), meat production accounts for 2.1% of total greenhouse gas emissions.

IF EVERYBODY IN THE USA WENT MEATLESS EVERY MONDAY FOR AN ENTIRE YEAR...

...THE NATIONAL CARBON FOOTPRINT WOULD DECREASE BY LESS THAN 1/3 OF ONE PERCENT

Source: Design, wording and data copyright held by Dr. Jude L. Capper; 2012; Photo credit: svariophoto via http://iStockphoto.com
All Consumers Deserve a Choice

- **Reuben**
  - Corned beef, gruyere, sauerkraut, Russian dressing on rye bread with mango-fennel slaw and pickles

- **Smoked Trout Po' boy**
  - Butter, papitas, peppadews, marinated onions and smoked trout on herbed roll with Tim's potato chip and black eyed pea, mango and papaya chutney

- **Caprême Baguette**
  - Basil, tomato, fresh mozzarella, olive oil, salt and pepper on baguette with Caesar salad and kalamata olives

- **Mediterranean Pita (Vegan)**
  - Roasted tomatoes, garbanzoes, artichoke hearts, kalamatas and arugula on herbed pita with corn chips and Muhammara

We Can Replace Meat and Dairy with Vegetable Proteins
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But humans make methane too!

Source: Created by Dr. Jude L. Capper, 2012
If We All Became Vegan...

In 10 years we would have **612 million** cattle in the USA. In 20 years time, **3.7 billion** a 41x increase.

Source: Created by Dr. Jude L. Capper, 2014. Based on 85% of cows having a live calf, cows living for 20 years and 95% of calves surviving.
“A general conclusion... improving the resource use efficiency of livestock production can reduce environmental impacts.”

Environmental Impact of U.S. Beef Production has been Reduced by Improved Productivity

![Bar chart showing the percentage reduction in various resources per lb of beef produced in 1977.](chart.png)

- **Animals**: 70%
- **Feed**: 81%
- **Water**: 88%
- **Land**: 67%
- **Carbon Footprint**: 84%

*All values expressed per lb of beef produced*

Modern US Milk Production Has Considerably Lower Resource Use and Carbon Emissions

*All values expressed per gal of milk produced at the farm gate*

The U.S. Swine Industry Has Reduced its Environmental Impact Since 1959

- Breeding Herd: 61%
- Feed: 33%
- Water: 59%
- Land: 78%
- Carbon Footprint: 65%

*All values expressed per gal of hot dressed carcass weight poultry produced

Source: Created by Jude L. Capper, 2012; Data from Cady et al. (2013) A 50-year comparison of the environmental impact and resource use of the US swine herd: 1959 vs. 2009. ADSA-ASAS Annual Meeting, 2013, Indianapolis, IN
U.S. Egg Industry Uses Fewer Resources and Emits Less GHG than in 1960

*All values expressed per kg of eggs produced

Source: Created by Dr. Jude L. Capper, 2014; Data from Xin, H. et al. (2013) A Comparative Assessment of the Environmental Footprint of the U.S. Egg Industry in 1960 and 2010. Egg Industry Center, Iowa State University, Ames, IA.
Globally, 33% of Food Is Wasted

Source: Created by Dr. Jude L. Capper, 2013; Photo from Dr. Jude L. Capper; Data from FAO (2013) “Food Wastage Footprint – Impacts on Natural Resources”. FAO, Rome, Italy.
Thank you!

jude@livestocksustainability.com
http://bovidiva.com/presentationlinks

In honor of Earth Day, she vowed to release no methane for 24 hours.

Jude Capper
@bovidiva
www.bovidiva.com