Grand Challenges Related to Livestock Production and Water Use
Nebraska Beef Cattle Production

- 1.9 million cows
- 5.1 million feedlot cattle
- #1 in beef processing
- #2 in feedlot cattle
- $12.1 billion – beef
- $22 billion – agriculture
- $80 billion NE GDP
The Golden Triangle

Corn

Nebraska

Ethanol

Cattle
Water challenges for beef production

• Production

• Perception

<table>
<thead>
<tr>
<th>Crop</th>
<th>Water Usage per Pound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potatoes</td>
<td>60 gallons per pound</td>
</tr>
<tr>
<td>Wheat</td>
<td>108 gallons per pound</td>
</tr>
<tr>
<td>Corn</td>
<td>168 gallons per pound</td>
</tr>
<tr>
<td>Rice</td>
<td>229 gallons per pound</td>
</tr>
<tr>
<td>Soybeans</td>
<td>240 gallons per pound</td>
</tr>
<tr>
<td>Beef</td>
<td>12,009 gallons per pound</td>
</tr>
</tbody>
</table>
Grass Regions in Nebraska

ECOREGIONS OF NEBRASKA

NEBRASKA NATURAL LEGACY PROJECT
Water challenges for beef production

- Production
  - Drought
  - Forage production
  - Crop production
  - Irrigation
  - Sustainability
Issues of perception
Water Footprint

- 1 kg of beef requires
  - 20,000 Liters (Pimentel et al., 1997)
  - 3,682 Liters (Beckett and Oltjen, 1993)
  - 1,763 Liters (Capper, 2011)
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Do we have accurate inputs?

- Example – Water intake by cattle
  - Beckett and Oltjen
    - 1956 water intake model by Winchester and Morris
  - Capper
    - German model using Holstein bulls
    - Water intake a function of:
      - Temp
      - DMI
      - Roughage
      - DM of roughage
      - BW
Water challenges for beef production

• Production
  • Drought
  • Forage production
  • Crop production
  • Irrigation
  • Sustainability

• Perception
  • Water footprint
  • Accurate Inputs
  • Units
  • Double accounting
  • Strategies to improve
  • Sustainability
Summary of Ideas

- Beef is important to Nebraska
- Nebraska is epicenter of beef

- Production issues require sustainability
- Perception issues require sustainability