Managing environmental issues – related to beef an international perspective

Tim McAllister
Lethbridge Research Centre
Agriculture & Agri-Food Canada
Implications of sustainability for the beef industry

- Food
  - Safe
  - Security
  - Affordable

- Environment

- Economic

Sustainability
World population: 1800-2100 and projections (the variants)
World population density 2012 (people/km$^2$)
Gapminder World Demonstration
China eats half as much meat as the U.S., but because two-thirds of its meat has traditionally been high-fat pork, it consumes more total meat calories. Now demand for leaner meat is rising.
Per capita GDP
Per capita crop calories
Per capita crop protein

(A) Per capita GDP, (B) per capita demand for crop calories, and (C) per capita demand for crop protein in 2005 (black) and mean projected 2050 increases (white; percent increases above bars).

Tilman D et al. PNAS 2011;108:20260-20264
Per capita meat consumption, 2000-2050

Source: IFPRI IMPACT projections, September 2007
Worldwide meat production

Million tonnes, average 2010-2012, data for 2012 are estimated
Land in use at present, increase to 2050 and remaining balance in 2050
GHG emissions from global livestock supply chains, by productions activities and products
Regional variation in beef production and GHG intensities

Source: GLEAM
A Brazilian example: capacity strengthening and TT

194 “pilot-units” coordinated by Empraba (2011)
A Brazilian example: capacity strengthening and TT

- 365% increase in Total crop production (1996-2006)
- 10X increase in Beef exports (tenfold increase)

World's largest exporter

- Beef, poultry and sugar cane
Restoring value to grasslands

Ex.: Carbon mitigation in productive pastures

![Graph showing soil organic matter content over years. The graph compares Corn/soybean rotation, Pasture following crop, and Crop following pasture. The data is from Sousa et al., 1997.](graph.png)
Restoring value to grasslands

Increasing cropping intensity

<table>
<thead>
<tr>
<th>Month</th>
<th>2nd Crop</th>
<th>3rd Crop</th>
<th>1st Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jun</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jul</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aug</td>
<td>2000 - 6000 kg/ha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sept</td>
<td></td>
<td>3rd Crop</td>
<td></td>
</tr>
<tr>
<td>Oct</td>
<td></td>
<td></td>
<td>1st Crop</td>
</tr>
<tr>
<td>Nov</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apr</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

G.B. Martha elaboration.
Brazil’s Forest Code

- Landowners must conserve a percentage of their terrain forested
  - 80% Amazon area
  - 35% Cerrado area
  - 20% other parts of Brazil

- Permanent preservation areas
  - Springs
  - River borders
  - Areas with declivity > 45°
  - top of hills (higher than 100 m)
  - areas with altitude higher than 1800 m
Brazil’s Forest Code
Brazil’s Forest Code

Spring
50 m of radius

Nº 12.651, May 25th of 2012
Brazil’s Forest Code
Figure 12.1. Norway: Producer Support Estimate by country, 2004-06
Per cent of value of gross farm receipts

- Support based on output or on input use
- Payments based on A/An/R/I, production not required
- Payments based on A/An/R/I, production required
- Payments based on non-commodity criteria

A (area planted), An (animal numbers), R (receipts) or I (income).
1. EU25. 2. The OECD total does not include the six non-OECD EU member states.

Our Aspiration
• Develop global principles and criteria in 2014
• Develop targets for purchasing verified sustainable beef
• Begin purchasing in 2016

Our Vision
Production systems that:
• Optimize cattle's impact within ecosystems and nutrient cycles
• Positively impact the lives of their employees and the communities in which they operate
• Care for the welfare of the cattle throughout their lives

Our Approach
• Create principles and criteria for sustainable beef production
• Identify and test sustainable beef production practices
• Lead with transparency and engagement
• Work closely with suppliers and partners for industry change
Water pollution and usage
- Surface water
- Sediment from erosion
- Overall water use

Industrial pollution
- Waste from slaughterhouses/tanery

Soil degradation
- Contribution to soil erosion
- Deforestation
- Soil compaction

Climate change
- Greenhouse gas emissions
- Carbon loss
"We envision a world in which all aspects of the beef value chain are environmentally sound, socially responsible and economically viable."

GRSB Mission

"The GRSB mission is to advance continuous improvement in sustainability of the global beef value chain through leadership, science and multi-stakeholder engagement and collaboration."
Livestock Environmental Assessment and Performance (LEAP) Partnership
Beef production & efficiency

• Each point of beef produced in the USA today requires:
  – 30% less animals
Beef production & efficiency

• Each point of beef produced in the USA today requires:
  – 30% less animals
  – 14% less water
Beef production & efficiency

• Each point of beef produced in the USA today requires:
  – 30% less animals
  – 14% less water
  – 34% less land
Beef production & efficiency

• Each point of beef produced in the USA today requires:
  – 30% less animals
  – 14% less water
  – 34% less land
  – 18% smaller carbon footprint
Beef production & efficiency

• Each point of beef produced in the USA today requires:
  – 30% less animals
  – 14% less water
  – 34% less land
  – 18% smaller carbon footprint
  – Generate 20% less manure
Beef production & efficiency

• Each point of beef produced in the USA today requires:
  – 30% less animals
  – 14% less water
  – 34% less land
  – 18% smaller carbon footprint
  – Generate 20% less manure
  – 16% less greenhouse gas emissions
In brief, we need food systems that are:

- profitable
- efficient
- safe
- nutritious
- equitable
- ‘green’

For all
The McAllister Team
Thank you

Questions?
A Time for Action
Access to safe, proven, efficiency-enhancing technologies ensures:

THE THREE RIGHTS

1. **FOOD**
a basic human right

2. **CHOICE**
a consumer right

3. **SUSTAINABILITY**
environmentally right
Progress in reducing hunger is assessed against two key targets: the 1996 World Food Summit (WFS) target aimed at halving the number of undernourished by 2015, while the first Millennium Development Goal (MDG) aimed at halving the proportion of hungry people by 2015.

- In 2011–13 a total of 877 million people were hungry in developing regions. This number has fallen by 169 million, or 17 percent, since 1990–92.
- More than 60 countries have reached or are expected to reach the MDG hunger targets. Significant reductions have occurred in most countries of Eastern and South-Eastern Asia, and in Latin America.
- The World Food Summit target is out of reach, at least at the global level. Yet approximately 20 countries have met the target or are estimated to do so by 2015.
- In 16 countries, undernourishment estimates for 2011–13 either point to a lack of progress or a deterioration of food security conditions since 1990–92. Nine of these countries are in sub-Saharan Africa, the region with the highest prevalence of undernourishment and where only modest progress has been made in recent years.

For additional information please visit: http://www.fao.org/economic/ess/
Real world meat prices projected to rise 20-30% beyond current high levels

Meat

Source: IFPRI
Global livestock production and GHG emissions from livestock, by commodity and regions