Food security and animal production – what does the future hold?

Jimmy Smith, Director General, ILRI, Kenya
With: Dieter Schillinger, Delia Grace, Tim Robinson, Shirley Tarawali

IFAH Europe sustainability conference, Brussels, 11 June 2015
Key messages

• Demand for animal source foods is increasing rapidly - almost all the increase is in developing countries
• Despite this, food and nutritional challenges remain
• Small producers dominate the food economy in the developing world and can respond to the demand pull and do so in environmentally sustainable and healthy ways
• New markets for European agriculture and agri-food industry are emerging
The challenge: Is attaining global food security and sustainable food production possible?

How will the world feed itself sustainably by the time the population stabilizes about 2050?

• 60% more food than is produced now will be needed
• 75% of this must come from producing more food from the same amount of land
• The higher production must be achieved while reducing poverty and addressing environmental, social and health concerns
• This greater production will have to be achieved with temperatures that may be 2–4 degrees warmer than today’s

Demand for animal source foods rising fastest
Animal source foods: 4 of 5 highest value global commodities

Cow milk has overtaken rice
Drivers of change: population

Anticipated change 2013 – 2050
Asia: +20%
Africa: +113%
Europe: -4%
2015 GDP growth forecast
Percentage urban, 2014
Gains in meat consumption in developing countries are outpacing those of developed
% growth in demand for livestock products

Based on anticipated change in absolute tonnes of product comparing 2000 and 2030
Nutritional divides among 7 billion people today

- Chronic hunger
- Inadequate diets
- Overweight
- Obese
- Balanced diets

11% of GNP lost annually in Africa and Asia from poor nutrition

Chronic disease likely to cost $35 trillion by 2030
Food insecurity and under nutrition remain persistent

72 developing countries have reached the 2015 MDG 1 target of halving the proportion of hungry people. Hunger remains an everyday challenge for almost 795 million people worldwide, including 780 million in developing regions.

2014-2016
What’s special about animal/smallholder food?

• 90% of animal products are produced and consumed in the same country or region
• Most are produced by smallholders
• Over 70% of livestock products are sold ‘informally’
• 500 million smallholders produce 80% of the developing world’s food
• 43% of the agricultural workforce is female
Demand for livestock commodities in developing economies will be met – the only question is how

Scenario #1
Meeting livestock demand by \textit{importing livestock products}
Demand for livestock commodities in developing economies will be met – the only question is how

Scenario #1
Meeting livestock demand by importing livestock products

Scenario #2
Meeting livestock demand by importing livestock industrial production know-how
Demand for livestock commodities in developing economies will be met – the only question is how.

Scenario #1
Meeting livestock demand by *importing livestock products*

Scenario #2
Meeting livestock demand by *importing livestock industrial production know-how*

Scenario #3
Meeting livestock demand by *transforming smallholder livestock systems*
Sustainable animal food systems are a must

- **Productivity and efficiency:**
  - Sufficient food with lower environmental footprint: Animal health, genetics, feeding

- **Animal source foods:**
  - Safe, not wasted and consumed in appropriate quantities

- **Emerging challenges:**
  - Zoonotic diseases
  - Anti-Microbial Resistance
Net trade of meat and milk in developing countries (million metric tonnes)

Historical trends and baseline projections with climate change

Source: Rosegrant et al. 2014
Growth of intensive systems

How to intensify without concentration?
Replacing the 90% of locally produced animal commodities is not feasible

**Economically**
Africa’s food import bill (2013): US $ 44 billion

About one fifth is livestock (highest after cereals):
Meat: US $ 5 billion; Milk: US $ 4 billion

**Or for livelihoods**
Almost 1 billion rely on livestock for livelihoods
43% of the agricultural workforce is female
Using technical, market and institutional interventions to assess yield gaps

**Graph 1:**
- **Y-axis:** % potential gain from interventions
- **X-axis:** S.Asia dairy, E.Africa dairy, W.Africa beef, W.Africa s.ruminants, S'n Africa small ruminants
- **Legend:** Genetics, Health, Feed

**Graph 2:**
- **Y-axis:** % potential gain from interventions
- **X-axis:** S.Asia dairy, E.Africa dairy, W.Africa beef, W.Africa s.ruminants, S'n Africa small ruminants
- **Legend:** Mkt access, Input delivery
As much as half of the agricultural GHG emissions come from animals

GHG per kg of animal protein produced varies hugely: Big opportunities to mitigate

Herrero et al. 2013
Most (75%) emerging diseases come from animals and cost up to US $ 6 billion annually.

Emerging zoonotic disease events, 1940–2012

ILRI report to DFID: Mapping of Poverty and Likely Zoonoses Hotspots, 2012
## Costs of emerging zoonotic disease outbreaks (US$ billion)

<table>
<thead>
<tr>
<th></th>
<th>Period</th>
<th>Cost (conservative estimates)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 outbreaks excluding SARS</td>
<td>1998–2009</td>
<td>38.7</td>
</tr>
<tr>
<td>- Nipah virus (Malaysia)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- West Nile fever (USA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- HPAI (Asia, Europe)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- BSE (US)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Rift Valley fever (Tanzania, Kenya, Somalia)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- BSE (UK) costs 1997–09 only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SARS</td>
<td>2002–2004</td>
<td>41.5</td>
</tr>
<tr>
<td>Total over 12 years</td>
<td>1998–2009</td>
<td>80.2</td>
</tr>
</tbody>
</table>

Giving an annual average of US$6.7 billion
Antimicrobial resistance

Global antimicrobial use in food animals
(mg per 10km pixel)

Source: Van Boeckel et al. 2015
Global antimicrobial consumption will rise by 67% by 2030

Antibiotic use in Africa: 418 tonnes annually
Average OECD country: 864 tonnes annually

AMR information lacking: CVOs in Africa
66% had no information on AMR in animals
21% considered it was occasional
4% common
9% not present in their country

AMR in developing countries – varied causes:
• resistance the result of the animal being treated with antimicrobials,
• the result of antimicrobials in the environment originally used to treat people
other pathways
A valuable market: examples

- Market value of animal source foods in Africa in 2050 estimated as US $151 billion
- Globally disease reduces livestock productivity by 25% - valued at US $300 billion per year
- Livestock diseases cost Africa between US $9 – 35 billion per year
- Annual global investment of US $25 billion in one health approaches could save as much as US $100 billion annually
Developing world - New market opportunities

- Animal source food products – cold dressed and processed
- Pharma industries
- Genetics
- Feeds

- Be on the ground
- Combine proprietary and open access approaches
- Public-Private Partnerships
better lives through livestock