The changing livestock sector in developing countries: the context for animal genetic research

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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
- Human health and environmental challenges associated with animal source foods important
- Much animal protein is produced by smallholders in developing countries

Opportunities for research in general, animal genetics in particular to contribute to
Cow milk has overtaken rice.
Drivers of change: population

Anticipated change 2013 – 2050
Asia: +20%
Africa: +113%
Europe: -4%
2015 GDP growth forecast
Gains in meat consumption in developing countries are outpacing those of developed
% growth in demand for livestock products
2000 - 2030

Based on anticipated change in absolute tonnes of product comparing 2000 and 2030
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
Nutritional divides among 7 billion people today
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
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
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
Smallholders still dominate livestock production in many countries

<table>
<thead>
<tr>
<th>Region</th>
<th>Beef</th>
<th>Chicken meat</th>
<th>Sheep/goat meat</th>
<th>Milk</th>
<th>Pork</th>
<th>Eggs</th>
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<td>East Africa</td>
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<td>(backyard)</td>
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Various sources: BMGF, FAO and ILRI
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
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

- Business as usual: the import bill doubles

- **Or for livelihoods**
  - Almost 1 billion rely on livestock for livelihoods
Research for development solutions

• Food & nutritional security
• Poverty eradication
• Environment & human health
Livestock genetics in the midst of this complexity

- Improved genetics
  - Improved productivity
  - Lower disease risk
  - Reduced emissions intensity
  - Less zoonoses
  - Respond to new challenges
    - Indirect: vectors – disease
    - Direct: climate; markets; ........

Targeting: by system; commodity
Delivery and ‘maintenance’
Information
Using production from different genotypes and production systems to assess gaps

Effects of different management strategies on the increase in value of annualized milk off-take

- A = reproduction only
- B = reproduction only
- C = health only
Using productivity data combined with modelling to assess gaps

Gains from dairy technology interventions:
Value of change in milk yields only