Interactions between intensifying livestock production for food and nutrition security, and increased vulnerability to AMR and zoonoses

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Context to the intensification of livestock food systems
- Human Population
Population change
(FAOSTAT population 1961 to 2050 in billions)

Much of the increase will take place in Asia and Africa
Global population – rural and urban estimates 1961 to 2050 (FAOSTAT, 2015)

The increase will be in the urban areas
Food system change
Simple food system

Family or household

Production

- Product
- Residues
- Fresh Produce
- Labour

Processing

Consumption

Processed Product

Labour

$\quad$ Inputs

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Products sold to consumers with low demands on quality certification and who process the food in their homes

Purchased Inputs

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Complex food chain

Providers of inputs and services

Middlemen, transport, traders

Producer -> Processor -> Marketers

Products sold to consumers with sophisticated demands who do very little home processing

Middlemen, financial services
Zoonoses and AMR in the livestock food systems
Livestock food system

- Provides food
- Moves money
- Generates employment
- People in the chains are GEOGRAPHICALLY DISPERSE – great likelihood of information asymmetries
In the livestock food system, zoonotic pathogens, resistance organisms or genes can be:

- maintained
- spread in both directions
- introduced from external sources
Food system and information

Government working with the private sector

Feed Inputs  Production System  Transport  Abattoir  Processing & marketing  Preparation  Consumer

Information in the food system:
- can be transferred between people
- can be hidden by people – information asymmetry
- can be made available by regulators outside the system – government, others??
Food systems, zoonoses and AMR
- *Where to intervene?*

• Standard questions would be:
  - Is the intervention technically feasible?
  - What is the cost and effectiveness of the intervention?
  - Is the intervention socially acceptable?

• In a **complex food system** these **questions** need to be **expanded** to include:
  - Can an intervention be monitored and valued across the food system? – how best to **manage and limit information asymmetry**
  - How will **people’s decision making** be affected by the intervention?
  - What do we know about **rule-breakers**?
Data on a livestock food system
- Nairobi
Questions posed

- Overarching issue for the research was the emergence of disease from food systems
- Initially the work aimed to answer:
  - What do the livestock food systems in Nairobi look like?
  - How do these livestock food systems operate?
  - Which people are involved and what rules do they work to?
  - Do the activities of the people involved in the livestock food systems impact, positively and negatively, on the emergence of disease and food safety?
A component of the red meat food system

**Nutrition**

**Demand**
Questions that emerged

- Further questions emerged that related to nutrition and demand
- These included:
  - What are vulnerable people in the urban space eating?
  - Are their diets adequate for health?
  - What is the demand for livestock products?
  - Does the food system give adequate access for people to make healthy decisions on their diet?
Trade-offs and synergies

• Vulnerable people in urban settings are likely to be malnourished
• Their deficiencies could be solved by animal source foods, but the food systems are not working to allow this
• Zoonoses and AMR is only a component of this system and if implemented harshly could well have impacts on food price
• Therefore gains in health and well-being through safety issues could be lost through impacts on nutritional value
CGIAR, food systems, zoonoses and AMR
Gaps and opportunities

• The ILRI work on **livestock food chains** could contribute strongly to an improved understanding of the general importance of these diseases and their epidemiology, and to the development of **cost-effective mitigation measures**

• Such work should move in the direction of understanding the **dynamics of the food systems** and how these change, bringing together skills from the **basic biological sciences, economics and social sciences**.

• This could focus on specific disease and health issues – brucellosis, Q fever, AMU/AMR complex
Gaps and opportunities

• Further engagement with the **private sector companies** who manage feeding, housing and health of animals
• Sharing of state of the art surveillance and diagnostics with these companies
• In exchange, privately-held data on animal health and disease is needed in order to estimate disease losses and expenditure, feeding into the information being generated through the Global Burden of Animal Disease programme.
Win more, lose less: Capturing synergies between SDGs through agricultural research

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