Livestock and Climate Smart Agriculture Innovations

Speakers: Dr. Adegbola T. Adesogan, Dr. Polly Ericksen and Ms. Sofía Condés
Introductory Remarks: Robert Bertram
Moderators: Cate Flanley and Erin Menzies Pluer
Rob Bertram is the Chief Scientist in USAID’s Bureau for Resilience and Food Security, where he serves as a key adviser on a range of technical and program issues to advance global food security and nutrition. In this role, he leads USAID’s evidence-based efforts to advance research, technology and implementation in support of the U.S. Government’s global hunger and food security initiative, Feed the Future. He previously served as Director of the Office of Agricultural Research and Policy in the Bureau for Resilience and Food Security, which leads implementation of the Feed the Future research strategy and related efforts to scale innovations in global food security efforts, working with a range of partners. Prior to that, he guided USAID investments in agriculture and natural resources research for many years. Dr. Bertram’s academic background in plant breeding and genetics includes degrees from University of California, Davis, the University of Minnesota and the University of Maryland. He also studied international affairs at Georgetown University and was a visiting scientist at Washington University in St. Louis. He has been especially active in plant genetic resources policy as it relates to research for development, including applications of biotechnology in food security-related research. Before coming to USAID, he served with USDA's international programs as well as overseas with the Consultative Group on International Agricultural Research (CGIAR) system.
Dr. Adesogan is a Professor of Animal Nutrition, Director of the Food Systems Institute as well as Director and Principal Investigator of the Feed the Future Innovation Lab for Livestock Systems (LSIL) at the University of Florida. His research interests include sustainable improvement of livestock production, using animal-source foods to improve human nutrition and health, improving the quality, conservation and utilization of forages to improve animal production and welfare; using feed additives to improve manipulate rumen digestion and enhance animal performance; using legumes to enhance the sustainability of animal production, and using plant nutraceuticals to improve animal health and performance.
Dr. Polly Ericksen

Polly Ericksen leads a research program on Sustainable Livestock Systems at the International Livestock Research Center, based in Nairobi, Kenya. She has over 25 years of experience at the interface between research and development focusing on global environmental change and agricultural development. This includes work in Latin America, South Asia and Africa. She holds an MSc in Economics and a PhD in Soil Science, both from the University of Wisconsin-Madison. Prior to joining ILRI she worked at the Environmental Change Institute at the University of Oxford, the Institute for Climate and Society at Columbia University, and Catholic Relief Services.
Sofía Condés

Sofía joined the FAIRR Initiative in April 2021 as Investor Outreach Manager. She leads FAIRR’s investor outreach efforts in francophone and hispanophone countries and supports outreach activities globally. She also coordinates FAIRR’s involvement in the multi-stakeholder initiative ‘Investor Action on AMR’. Previously, she led the Innovative Finance Programme of the Global Alliance for Improved Nutrition (GAIN). She also worked as a Strategy Specialist at the World Economic Forum (WEF) and as an Analyst for J.P. Morgan. Sofía holds a BA in International Relations and Economics from the University of Geneva, a Masters in International Development and Economics from the Graduate Institute in Geneva (IHEID) and a Masters in Public Health and Health Economics from the London School of Hygiene and Tropical Medicine (LSHTM). She also holds a CFA certificate in ESG investment. She has worked on projects and initiatives in Europe, Latin America and Africa and is passionate about the role of finance in improving food systems and global health.
Promoting Climate-Smart Technologies to Enhance Livestock Production and Human Nutrition

Feed the Future Innovation Lab for Livestock Systems
**Animal Source Foods are “nutrient power packs”**

- Superior quality (ideal) protein
- Higher energy density
- Higher nutrient density
- Better nutrient bioavailability

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Advantage vs. plant source food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>Higher quality / complete</td>
</tr>
<tr>
<td>Iron</td>
<td>Only dietary source of bioavailable haem</td>
</tr>
<tr>
<td>Zinc</td>
<td>More bioavailable</td>
</tr>
<tr>
<td>Calcium</td>
<td>More bioavailable</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>Only dietary source</td>
</tr>
<tr>
<td><strong>Vitamin A</strong></td>
<td>Only preformed source (retinol), more bioavailable</td>
</tr>
<tr>
<td>Vitamin D3</td>
<td>Only dietary source; more active and bioavailable than D2</td>
</tr>
<tr>
<td>Choline</td>
<td>Main dietary source</td>
</tr>
<tr>
<td>EPA and DHA</td>
<td>Main dietary source</td>
</tr>
<tr>
<td>Thiamin, riboflavin,</td>
<td></td>
</tr>
<tr>
<td>Vitamin B-6, E</td>
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</tbody>
</table>
LIVESTOCK’S CONTRIBUTION TO GLOBAL GHG

Livestock 14.5%
Others 85.5%

FAO GLEAM, 2018
HUGE VARIABILITY IN LIVESTOCK EMISSIONS

Total emissions by region and species

- **10.1** North America
- **10.4** Western Europe
- **4.0** Near East & North Africa
- **2.2** Sub-Saharan Africa
- **2.7** Eastern Europe
- **19.4** East & Southeast Asia
- **9.7** South Asia
- **1.6** Oceania

Emissions intensity by region

- **Gerber et al., 2013**

FAO GLEAM, 2018
MITIGATION POTENTIAL OF THE GLOBAL LIVESTOCK SECTOR

CATTLE (37.2%)
PIGS (23.8%)
CHICKENS (17.3%)
BUFFALO 30.2%
SMALL RUMINANTS (40.9%)
Environmental impacts of foods based on nutrient density

GHG Footprint (in kg CO2eq) of eating enough food to acquire 1/3 of a typical adult (25+) recommended intake of Iron, Zinc, Calcium, Folate, Vitamin A & B12

(Ty Beal, 2021)
INTEGRATED SOLUTIONS FOR LIVESTOCK AND THE ENVIRONMENT

<table>
<thead>
<tr>
<th>GHG</th>
<th>KENYA</th>
<th>MILK</th>
</tr>
</thead>
<tbody>
<tr>
<td>-9.6</td>
<td>SUPPLEMENTATION WITH CONCENTRATE</td>
<td>8.9</td>
</tr>
<tr>
<td>-12.5</td>
<td>ESTABLISHMENT OF FODDER GRASSES AND LEGUMES</td>
<td>16.0</td>
</tr>
<tr>
<td>-9.8</td>
<td>FEED CONSERVATION (SILAGE)</td>
<td>9.0</td>
</tr>
<tr>
<td>-11.3</td>
<td>DEWORMING</td>
<td>14.5</td>
</tr>
<tr>
<td>-17.1</td>
<td>CONTROL OF DISEASE</td>
<td>25.0</td>
</tr>
<tr>
<td>-13.9</td>
<td>ARTIFICIAL INSEMINATION</td>
<td>13.3</td>
</tr>
</tbody>
</table>

http://www.fao.org/in-action/enteric-methane
ACCURATELY MEASURING GHG OF AFRICAN LIVESTOCK

What? Quantifying methane and carbon dioxide emissions from livestock in Burkina Faso and Ethiopia

How? GreenFeed machine (C-Lock Inc.)

Why?

• Generate among the first accurate data on livestock emissions
• Formulate climate-smart, balanced diets for productivity at least cost

Partners: INERA Burkina Faso, EIAR Ethiopia, Hawassa University, UC Davis
INTRODUCING IMPROVED CLIMATE RESILIENT FORAGES

What? New drought-resistant, high quality, high yield forage genotypes

How? Validated various best varieties over 3 years in Burkina, Niger and Ethiopia

Why?
- Climate change causing longer dry seasons and frequent droughts
- Hampers growth of “normal” varieties
- Allows year round feeding of livestock
- Improve livestock productivity

Partners: INERA Burkina Faso, EIAR Ethiopia, ICRISAT and University of Florida
INTRODUCING TOOLS FOR CLIMATE-SMART DIETS

What? App to formulate balanced diets that improve milk production, reduce GHG emissions & waste (Google App Store: L-FST)

How? App and related training package for extension staff and farmers

Why?
• Improved milk production among 94% of farmers
• Improved cow milk yield by 14%
• Provides needs-based, least-cost rations that optimize livestock productivity from scarce resources

Partners: Heifer International, UC Davis,
Next steps for us

• 15 new projects using climate-smart approaches to improve livestock production and ASF affordability, accessibility and safety

• Addressing identified capacity development gaps in our focal countries

• Seeking private sector/other partners for
  – Scaling our 50+ innovative climate-smart technologies/approaches
  – Policy advocacy to ensure enabling environments for livestock
  – Research collaborators to increase our scope and impacts

• Broadening our scope beyond livestock as part of the Food Systems Institute
Thank You!

livestock-lab@ufl.edu
https://livestocklab.ifas.ufl.edu/
Livestock and Climate Change in the OneCGIAR

Time for adaptation!
For more than a decade, mitigation has dominated

- Sixty-five percent of agricultural emissions related to livestock
- First agenda: to get better numbers for smallholder systems in Global South
  - Fix the models with better estimates
  - Fix the estimates with better empirical data
- Second agenda: to develop, test and validate “low emissions” interventions
  - Feed! More and better.
But climate change significantly affects livestock production!

- Heat stress has direct impacts on livestock yields
- Many forage yields will also be affected as temperatures increase
- As climate variability and extremes increase
  - Pasture yields will change
  - Disease vectors will change
  - Production systems will change along with livelihoods
Time for the mitigation co-benefits of adaptation for livestock (finally)
Livestock, Climate and System Resilience

• Landscape approach to offset emissions and build resilience.
• Context-specific solutions for smallholder households.
• Bundling climate information with other risk management services.
• Evidence for sustainable investment
• Policy and decision support
Livestock deserve the attention given to crops

• Adaptation is the major concern
  – We need evidence for impacts, interventions and investments!
• Mitigation is a co-benefit of many adaptation practices
• Social and economic tradeoffs of changing behaviour are key
Thank you!

Polly Ericksen p.ericksen@cgiar.org
Using Investor Influence to Address Climate Risks in Protein Supply Chains

The FAIRR Initiative
FAIRR is an ESG investor network with 300 members and $45 trillion of assets
Food Emissions Alone Makes 1.5°C Limit Impossible

“If fossil fuel emissions were eliminated immediately, emissions from the global food system alone would make it impossible to limit warming to 1.5°C and difficult even to realize the 2°C target.”

Business as usual emissions in the global food system are projected to take up almost the entire global carbon budget.

Physical and transition risks are not priced into today’s markets

<table>
<thead>
<tr>
<th>MARKET</th>
<th>REGULATION, POLICY, LEGAL</th>
<th>CONSUMER RESPONSE</th>
<th>TECHNOLOGY</th>
<th>PHYSICAL RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input cost increases</td>
<td>Carbon pricing and operational regulations</td>
<td>Shifting diets and consumer preferences</td>
<td>Investments required to enhance productivity and yield</td>
<td>Declining water supply</td>
</tr>
<tr>
<td>Downstream buyers imposing sustainability requirements on suppliers, limiting market access</td>
<td>Litigation</td>
<td>Reputational risk and supply chain transparency initiatives</td>
<td>Competition with alternative meats</td>
<td>Higher livestock mortality and lower growth rates due to temperature increase²</td>
</tr>
</tbody>
</table>

Note: Sample list of risks (not exhaustive)


Protein Producers Are Underprepared for Climate-Related Risks

Science-Based Targets (SBTs)

<table>
<thead>
<tr>
<th>Set an SBT</th>
<th>Committed to an SBT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maple Leaf</td>
<td>Cranswick (March 2020)</td>
</tr>
<tr>
<td>Mowi</td>
<td>Charoen Pokphand Foods (Sept 2020)</td>
</tr>
<tr>
<td>Grieg Seafood</td>
<td>Marfrig (Sept 2020)</td>
</tr>
<tr>
<td>Tyson Foods</td>
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</table>

Worst Performing KPI

“72% companies do not disclose information on Scope 3 Targets”
FAIRR Research & Tools

Protein Producer Index

Ranking 60 of the world’s largest animal protein producers based on 10 risk & opportunity factors.

Sustainable Proteins Hub

Assessing companies on protein diversification. Research and interviews on food-tech trends. Case studies of disruptive companies.

Climate Risk Tool

Analysing 40 of the largest protein producers and their vulnerabilities to 2° global warming scenario.
Engaging with the Food Sector on GHG Emissions

Climate Risk Tool 2.0
- First food sector analysis tool based on TCFD-aligned scenario analysis
- Quantifies transition and physical climate risk
- Enables quantitative portfolio risk assessment

Effective Risk Management

Investors

Companies

Reporting & Disclosure

Protein Producer Index
- GHG emissions
- Scope 1,2 and 3 reporting
- TCFD aligned scenario analysis
- SBTi approved emissions reduction targets

Engagements with Corporates
- Unpacking Labour Risks in Global Meat Supply Chains
- Managing Biodiversity & Climate Risks in Feed Supply Chains
- Building Sustainable Proteins Supply Chains

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Engaging to stop deforestation – Cerrado Manifesto

57 investors with $7.8 trillion AUM

FAIRR-led multi-stakeholder collaboration with investors, major NGOs and global food companies on deforestation in the Cerrado region to galvanise support and send a clear message on the need to halt deforestation

The Cerrado in Brazil, is one of the world’s most important biomes - home to 5% of the planet’s biodiversity and is responsible for sequestering 13.8 billion tonnes of carbon
Q&A