Increasing productivity of chickens through the African Chicken Genetic Gains (ACGG) project

Technologies, Platforms and Partnerships in Support of the African Agricultural Science Agenda, Abidjan, Cote d’Ivoire, 4-5 April 2017
What is the science? - How we got here

<table>
<thead>
<tr>
<th>Geography / Conditions</th>
<th>Breed</th>
<th>Average eggs/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Africa scavenging (sub)-humid</td>
<td>Indigenous</td>
<td>33</td>
</tr>
<tr>
<td>East Africa scavenging (sub)-humid</td>
<td>Indigenous</td>
<td>58</td>
</tr>
<tr>
<td>Egypt</td>
<td>Fayoumi</td>
<td>146</td>
</tr>
<tr>
<td>South Africa</td>
<td>Koekoek</td>
<td>204</td>
</tr>
<tr>
<td>Ghana (intensive feeding)</td>
<td>Naked Neck</td>
<td>288</td>
</tr>
<tr>
<td>Ghana (intensive feeding)</td>
<td>Frizzle Feather</td>
<td>287</td>
</tr>
<tr>
<td>Uganda</td>
<td>Kuroiler</td>
<td>180</td>
</tr>
<tr>
<td>India</td>
<td>Rainbow Star</td>
<td>160-180</td>
</tr>
<tr>
<td>India</td>
<td>CARI lines</td>
<td>198-220</td>
</tr>
<tr>
<td>Developed world</td>
<td>“Exotic”</td>
<td>300+</td>
</tr>
</tbody>
</table>

Source: Mwacharo et al 2008; Dessie et al 2011
Give up other farming for full-time poultry; intensive grain feeding competes with cheap imports.

Indigenous chickens  
Selected indigenous chickens  
Artificial hatching of indigenous chickens  
Artificial hatching of tropically adapted/crossbreds  
Intensive production

Egg Yield / Year:  
- Indigenous chickens 40-50  
- Selected indigenous chickens ~80  
- Artificial hatching of indigenous chickens ~80  
- Artificial hatching of tropically adapted/crossbreds 120-150 (semi-intensive)  
- Intensive production 250-300

Mortality:  
- Indigenous chickens 70-80%  
- Selected indigenous chickens 50-70%  
- Artificial hatching of indigenous chickens 10-20%  
- Artificial hatching of tropically adapted/crossbreds 5-10%  
- Intensive production <5%
Table. Relative contributions of the industrial and smallholder poultry sectors to total poultry production under different interventions to 2030

<table>
<thead>
<tr>
<th></th>
<th>Poultry meat</th>
<th></th>
<th>Eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Industrial</td>
<td>Smallholder</td>
<td>Industrial</td>
</tr>
<tr>
<td>2030 base</td>
<td>0.42</td>
<td>0.58</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Source: Herrero et al. 2016
7,500 Farmers

Longterm Genetic Gain Program

Testing Information
- Production/Productivity
- Mortality
- Input Access
- Preferences
- Profitability
- Farmers’ Perceptions

ACGG On-farm Testing-Research driving delivery at scale
Is there **evidence** of likely impact of successful technology/product adoption? - *The case of Tanzania*

- Kuroiler
- Koekoek
- Sasso
- Black Australorp
- XX ecotypes in the sites

![Map of Tanzania with ecotypes and regions](image)
ACGG Evidence - The case of Tanzania

ACGG Targeted Beneficiaries

- *The case for poultry* - Evidence that the contribution of poultry keeping to livelihoods is comparable to that of livestock

- *Genetic potential and profitability* - ~94% of ACGG farmers practiced supplementary feeding prior to being engaged in the study

Preliminary Findings

- *Production objectives* - Meat consumption and live sale

- *Trait preferences* - high egg production, less illness, large body size and weight
Is there a technology/product “near to market”? 
What is required for success?

- Day-to-day management of the genetic gains work;
- Multiply and sell parent stock and GPS to hatcheries;
- Maintain parent stock;
- Multiply and distribute commercial germplasms to mother units and/or farmers at scale

- Provide technical backstopping in the design of the LTGG, program-data capture, genetic evaluation, and capacity building

- Germplasm testing, data collection, storage and genetic evaluation of lines, feedback and quality assurance.

- Negotiate the IP and access to the preferred strains;
- Design and coordinate the LTGG program;
- Capacity assessment/gap analysis in the private/public sector partners; and
- Context specific capacity building

The platform members (ILRI, WUR, etc)

Private sector breeding companies in the program countries

National Agricultural Research System (NARS)

ILRI – Overall coordination of the program
Next Steps

- Continued strain selection and improvement
- Further private sector engagement
- Deeper engagement of input suppliers across the value chain
- Strengthening and contextualizing the Longterm Genetic Gains Program in each target geography
- Upscaling!