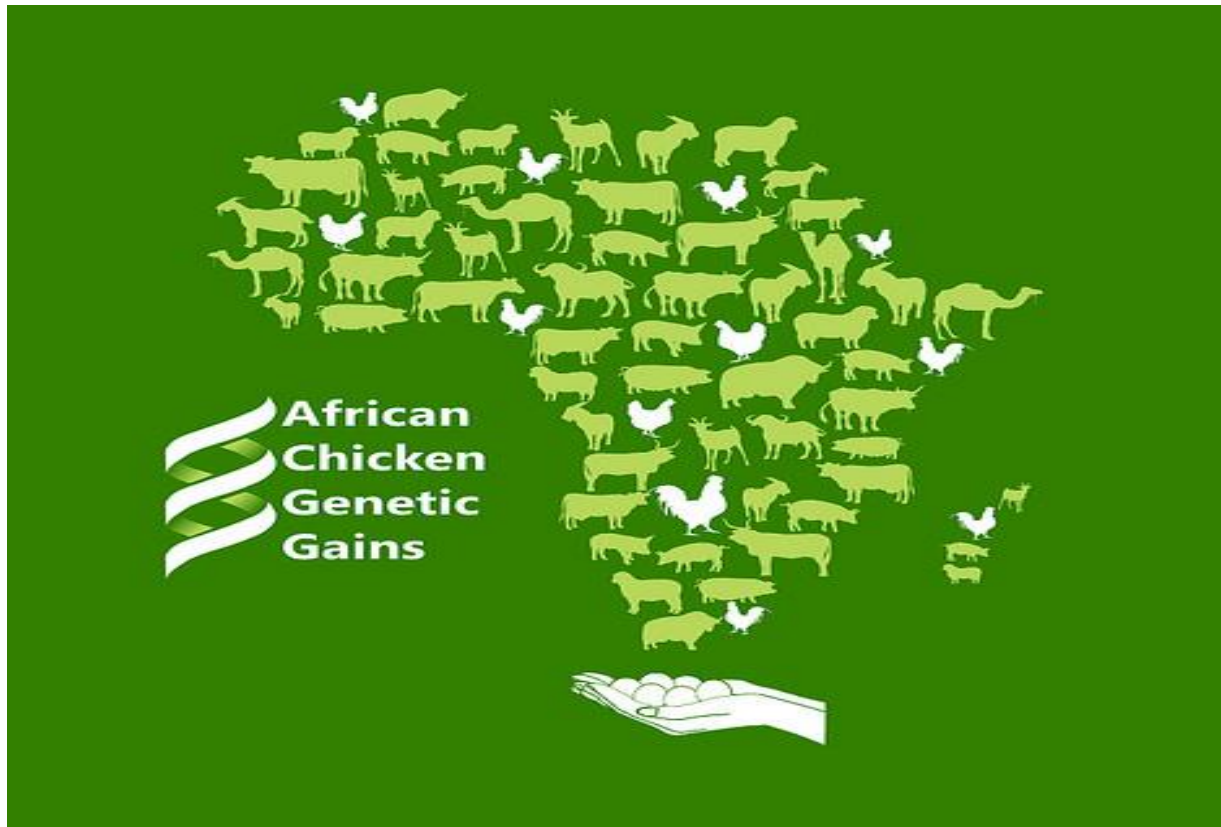


ACGG On-farm Chicken Performance Testing Protocol



International Livestock Research Institute (ILRI)

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BILL & MELINDA
GATES foundation

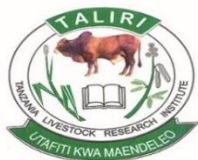


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Background

ACGG's on-farm chicken performance testing is implemented in Tanzania, Ethiopia and Nigeria to evaluate introduced and local (native and non-native) chicken strains under semi-scavenging management conditions for productivity, adaptability, and preference by farmers. The preference of various actors in the poultry value chain for chicken strains tested by ACGG will be rated through individual interviews and participatory methods. Information on chicken management practices of farmers, growth in household income and improvements in household nutrition will also be documented through out the test.

This *On-farm Chicken Performance Testing Protocol* is developed as a follow-up to the [ACGG Producer Level Baseline Survey Manual](#) and ACGG On-station Chicken Performance Testing Protocol. Topics covered in the *On-farm Chicken Performance Testing Protocol* include the experimental design, feeding and health management, human power and facility requirements, responsibilities of actors, and compensation mechanisms for farmers.

1. Experimental design

The selected [program sites](#) for ACGG's on-farm chicken performance testing comprise of a total of 3 countries and 15 sub-national areas (SNA).

The design of on-farm performance testing follows a Randomised Block Design (RBD). Please see the [on-farm manual](#) for details on data collection procedures.

A combination of contractual arrangements with publicly or privately owned facilities will be used for hatching and brooding. Once brooded, chicks will be transported to farmers by car (vans). All necessary precautions will be made to provide the chicks with water and nutrients during transportation.

The on-farm testing will be coupled with *Community-level Farmer Innovation Platforms*. ACGG's innovation platform (IP) is a space for learning and change for national and local actors in the poultry value chain. It is a forum for individuals who represent broad interests: farmers, traders, processors, researchers, wholesalers, retailers, government officials, poultry companies, transporters, input suppliers (vaccine, feed, germplasm *etc.*), consumer groups, and the research and development fraternity. Membership in the IP evolves depending on the type of problem being addressed. The IP identifies bottlenecks and opportunities in production, marketing and the policy environment in a structured way. They may design and implement activities as a platform, or coordinate activities by individual members.

All participant households will receive training on improved chicken husbandry (feeding, breeding, health, and housing).

Sample Size Justification

Sample size justification for the on-farm trial was calculated for each sub-national area, representing different agro-ecologies, in each country to ensure comparable precision for statistical analysis (and for logistical and project proposal commitment reasons). Because of the different numbers of villages in each sub-national area across countries (Nigeria – 12, Tanzania – 16, Ethiopia – 6 – 18) this means that in some cases the analysis may be over-powered (where villages > N required) but in a couple of situations may be under-powered (e.g. Ethiopia – Addis). Note that in calculations the number of households per village per strain is assumed to be lower in analysis (4) than at enrolment (6 – 8) because of drop-out and incomplete data anticipated from this longitudinal study. Response indicators used to

calculate sample size were: egg production per hen per year, weight at 12 weeks (male) and survival to 26 weeks. A summary of the justification is shown in the table below, this compares any two introduced strains; similar calculations were carried out for introduced vs. local strain but required sample size for this difference is lower in each case because of the larger differences expected.

Indicator	Egg production (/ hen / year)	Weight at 12 weeks (male)	Survival to 26 weeks
'Significant' difference between any two strains*	0.2 *Expressed as % of combined mean of 180; i.e. 20% = 36 eggs difference	0.3 *Expressed as % of combined mean of 1.75kg; i.e. 30% = approx. 0.5kg difference	0.3 *Assuming 1st strain = 65% and 2nd strain = 95%
Expected variation	0.04 assuming CV = 20%; s.d. = 20% of mean ¹	0.09 assuming CV = 30%; s.d. = 30% of mean ²	<i>n/a - note for above would prefer a smaller difference in mortality to be significant (e.g. 75% vs. 95%) but this would raise the number of villages required to 23</i>
Unadjusted number of birds per strain	16	16	24
Number of household per strain per village (for analysis)	4	4	4
Intra-cluster correlation within villages (ICC)	0.3	0.3	0.3
Design Effect	1.90	1.9	1.9
N adjusted	31	31	46
Number of villages required PER SUB-NATIONAL AREA (rounded-up)	8	8	12
¹ CV for egg production in commercial environment around 5% but assuming much higher for on-farm ² CV for growth rate in commercial environment around 15% for low-density systems, likely higher CV for on-farm Equations used: 2-sample normal calculation at 5% level of significance with 80% power for eggs and weight; 2-sample binomial equivalent for survival.			

2. Bird Management

2.1 Brooding and Health Management

Vaccination is considered to be the integral part of the brooding activity and opens an opportunity for ACGG to engage a range of public and private actors including farmers' groups, small and medium sized private enterprises, governmental and non-governmental veterinary establishments. Each household receives 25-30 vaccinated birds brooded to 42 days (6 weeks). These birds will be reared with high quality brooding practices and they will have received all standard vaccinations. Researchers from partner institutions identify appropriate brooding facilities and monitor their operation.

All flocks in participant households (introduced and existing birds) will be vaccinated at least against Marek's disease, Newcastle disease (NCD), infectious bursal disease (IBD or Gumboro), and fowl pox. Booster vaccinations will be given for NCD. Disease prevention and control programmes are to be designed in accordance with the specific needs of countries.

All flocks in participant households will also be dewormed on regular basis.

Farmers will be informed to notify village's field officer/enumerator in case of sickness or mortality of birds. The project will consult a veterinarian to determine the cause/nature of the disease and the result of the autopsy will be shared with you. Dead birds should be buried once the cause of death is determined.

2.2 Feeding Management

Farmers will be trained and informed about the importance of supplementation for better egg and growth performance of chickens. They will learn how to prepare supplementary feed constituting essential nutrients. However, no specific level of daily supplementation will be imposed on the farmers.

2.3 Housing

Participant households are expected to make available a poultry shed or night shelter for the experimental chickens. If an adequate night shelter exists prior to the launch of the study in your household, it is not necessary for them to build a new one.

3. Human power

High school or college graduates who earned their Diploma in Agricultural Sciences, possess a good understanding of the poultry production system of the specific project area, and speak the local language are hired in all project countries and trained on data collection procedures. One enumerator will be assigned at each village in a district to manage the on-farm data. A group of experts have also received training on wing-banding of chicks.

4. Responsibility of actors

The planning and execution of the on-farm testing will be the responsibility the country ACGG teams. Selection of strains and importation of their fertile eggs for exotic birds will be done in consultation with ILRI. The ACGG team at ILRI will provide technical backstopping in data management.

5. Community level sensitization

ACGG households in a village will be sensitized on selected topics through the innovation platform while other meetings will be organized for non-ACGG households in the community.

Table. Points to be addressed by the community level innovation platforms

Level	What
The ACGG intervention	<ol style="list-style-type: none"> 1. <i>The problem addressed:</i> need for tropically adaptive and productive chickens; 2. <i>Strains tested:</i> xx 3. <i>What is not known:</i> performance in that unique production environment; 4. <i>Purpose of the experiment:</i> test and scale up the those with superior performance and preferred; 5. <i>Need for random allocation of strains:</i> convince result benefits the whole community;
How the design works	<ol style="list-style-type: none"> 1. <i>Need to take measurements consistently:</i> cooperate with ACGG enumerators recruited from your village; 2. <i>Repeating on several farms:</i> need for reliable evidence 3. <i>Uniformity of management across households within village:</i> need for similarity of husbandry practices; 4. <i>Safeguarding experimental animals:</i> by-laws regulating entry and exit of chicken, ownership of products (eggs and chicken) during and after the test, disease prevention and control, compensation, provision of necessary inputs, how to join and leave the experimental activity; 5. <i>Means of benefiting all farmers:</i> scaling up in the village, the district and beyond.
Details needed	<ol style="list-style-type: none"> 1. Night shelters; 2. Supplementation; 3. Participation in tailor made vaccination programme and hygienic practices; 4. Who does what? (ACGG enumerators, experts from Local Office of Agriculture, Research/Institutes of Higher Learning, ACGG supervisors, farmers groups, the innovation platform)