

# Breeding Heartier Chickens in Africa



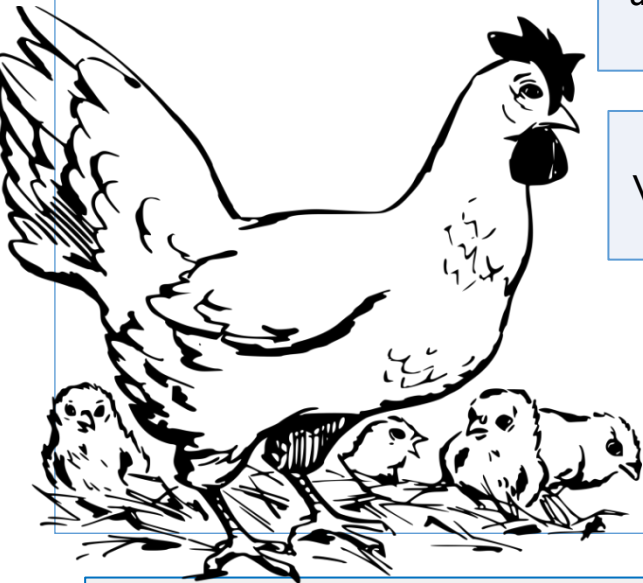
USAID  
FROM THE AMERICAN PEOPLE



Feed the Future Innovation Lab  
for Genomics to Improve Poultry

What are the optimal genotypes that will enable chickens to resist Newcastle Disease Virus (NDV) infection and heat stress?

**Discovery Phase**  
(4 years, 30 manuscripts)



Six indigenous ecotypes of African chickens (1600 birds) and African university renovations to establish breeding flocks

Hy-Line layer chicken line (1200 birds)

Human capacity strengthening:  
10 trainings  
(114 trainees)

Chicken lines in U.S. with varying innate NDV resistance (240 birds)

Lentogenic NDV challenge at moderate or high ambient temperature

Lentogenic NDV challenge  
Velogenic NDV field trial in Africa  
(4442 birds; 9 trials)

Resistance phenotype and 600K SNP

Re-sequencing of African ecotypes with extreme phenotypes

RNA-seq of different tissues at multiple time points  
(442 libraries; 4 terabyte data)

Candidate genes

Genome Wide Association Studies

SNPs and regions

Additional SNPs

Signaling pathways

Interaction Network

How can the information be used to develop sustainable infrastructure for small holder farmers in Africa?

Prioritize Single Nucleotide Polymorphisms (SNPs)

**Development Phase**  
(1.5 years, 2 manuscripts)

Develop economic SNP panel

Validate SNP panel

**Implementation Phase**  
(1 year, 2 manuscripts)

Genetic selection by SNP panel

Breeding and distribution of chicken strain with enhanced NDV resistance