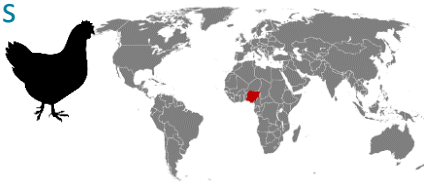
Improving poultry meat production in Nigeria

Most chicken meat is produced in low input, low yielding systems with indigenous poultry. Chicken meat production can be increased by feeding additional supplements and providing daytime housing and improving health care.



Current production system

There are three distinct poultry production systems in Nigeria; intensive commercial poultry (large flocks of modern hybrids), extensive poultry (associated with household raising small flocks of indigenous birds) and semi-intensive (a blend of the other two). Indigenous poultry generally scavenge during the day and are housed at night to reduce losses from predation and theft. There is often very limited supplementary feeding. Egg production is generally low, resulting in lower egg and meat production.

Issues limiting chicken meat production

Low growth rates

Largely caused by inadequate nutrition. Access to supplementary feed is low, and is generally of poor quality.

Low production

Largely caused by inadequate nutrition and high broodiness of low genetic potential indigenous birds.

High animal mortality

Largely caused by disease and predation through lack of daytime housing.

Using models to understand potential impacts

Bio-economic models can be used to simulate and understand the potential effects of changes to production systems. A baseline simulation is created to match current production systems, and different interventions are tested.

Models show what *could* happen, not what *will* happen, so results need to be interpreted with caution.

Modelled baseline

- Baseline indigenous flock size varied between 4-5 birds for the small flocks (10th percentile) through to 22-30 birds for the large flocks (90th percentile), based on LSMS Survey (2016) data modelled in VIPOSM (Udo et al. 2006).
- Four regions of Nigeria modelled.
- Loss of birds to predation varied between flock class but remained consistent across regions.
- Loss of birds to disease varied between flock class and region.
- Loss of birds to unknown losses remained consistent between flock class and region.

Modelled interventions to increase production

Vaccination

All birds vaccinated against Newcastle disease to reduce disease losses.

Improved feeding management

Supplementary feeding to produce more eggs and reduce age of first lay.

Improved housing

Flock retained indoors during the day to reduce predation.

Control of broodiness

Implementation of control measures to reduce broodiness, thus increasing egg production.

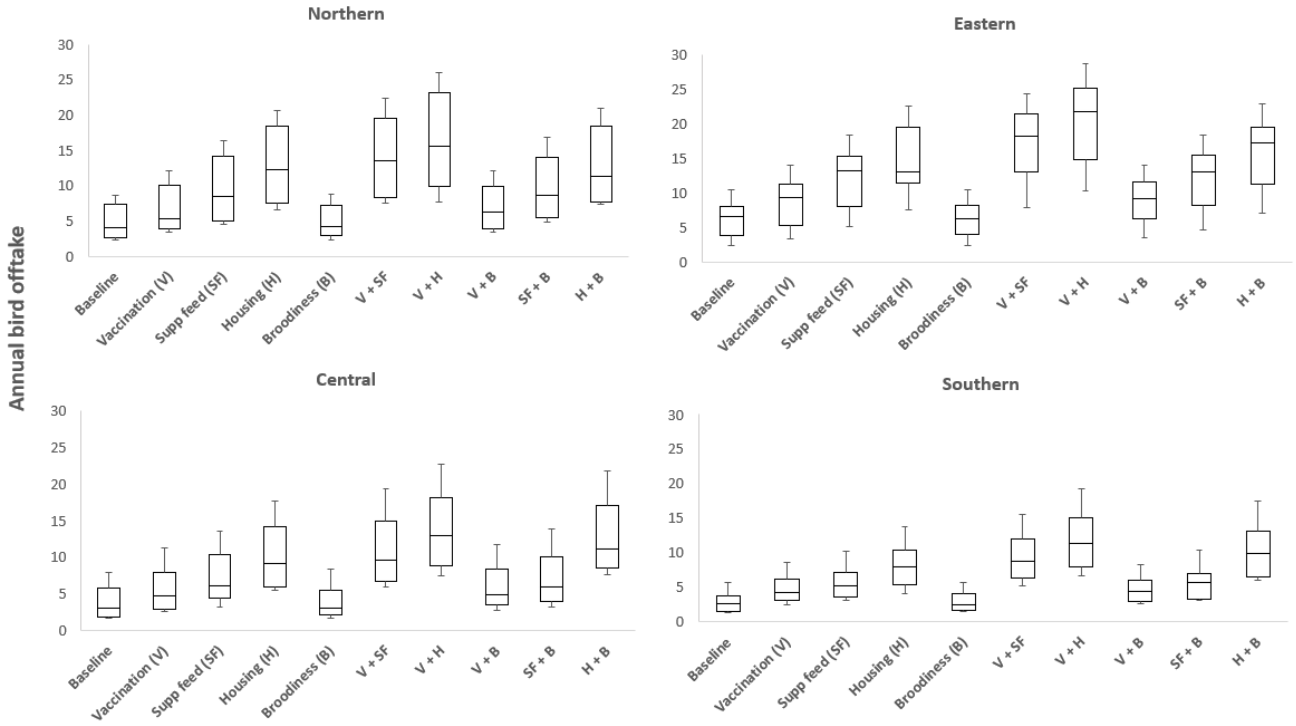
Combined interventions

Dual combination of the above-mentioned four intervention options, with the exception of combining supplementary feeding with housing.

Interventions can increase production

Median meat production (bird offtake as sum of birds consumed and sold) was 3-7 birds per annum for the baseline system. Most interventions increased meat production across all regions. Daytime housing produced the greatest increase in meat production across all regions. Median meat production increased to 8-13 birds per annum. In contrast, controlling broodiness resulted in marginal changes in meat production.

Newcastle disease vaccination combined with daytime housing (V + H) increased median meat production to 11-22 birds per annum (280% increase averaged across the four regions). Vaccination combined with supplementary feeding (V + SF), and control of broodiness combined with daytime housing (H + B) increased meat production by around 200%.



Annual bird offtake (consumed and sold) for the baseline and each intervention option across the four regions of Nigeria. Box plots are 10th, 25th, 50th, 75th and 90th percentiles, reflecting the increase in flock size from small to large.

Key messages

Bird offtake increased with all intervention options, although there was minimal change when controlling broodiness.

Combined interventions can be more successful than single interventions.

Combining vaccination with daytime housing resulted in the greatest increase in meat production, and by a rate similar to the sum of each option as single intervention options.

As flock size increased from small (10th percentile) to large (90th percentile), the percentage increase in meat production declined. This highlights greater benefit of implementing intervention options for small to medium producers.

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References: LSMS Survey (2016) https://microdata.worldbank.org/index.php/catalog/2734; Udo et al. (2006) Modelling the impact of interventions on the dynamics in village poultry systems. Agricultural Systems 88, 255-269.

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