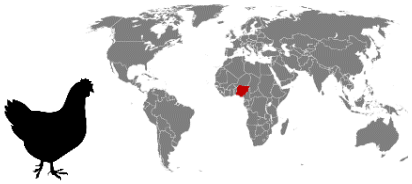
Improving poultry production in Nigeria - profitability of interventions

Most chicken meat and eggs are produced in low input, low yielding systems with indigenous poultry. Profitability can be increased by feeding supplements 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 poultry 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 VIPOSIM (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 and profitability

Vaccination

All birds vaccinated against Newcastle disease to reduce disease losses. Cost NGN 20/head per season.

Improved feeding management

Supplementary feeding to produce more eggs and reduce age of first lay. Cost NGN 25/kg feed.

Improved housing

Flock retained indoors during the day to reduce predation. Cost NGN 50, 150 and 225 for each chick, pullet/cockerel and hen/cock per season.

Control of broodiness

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

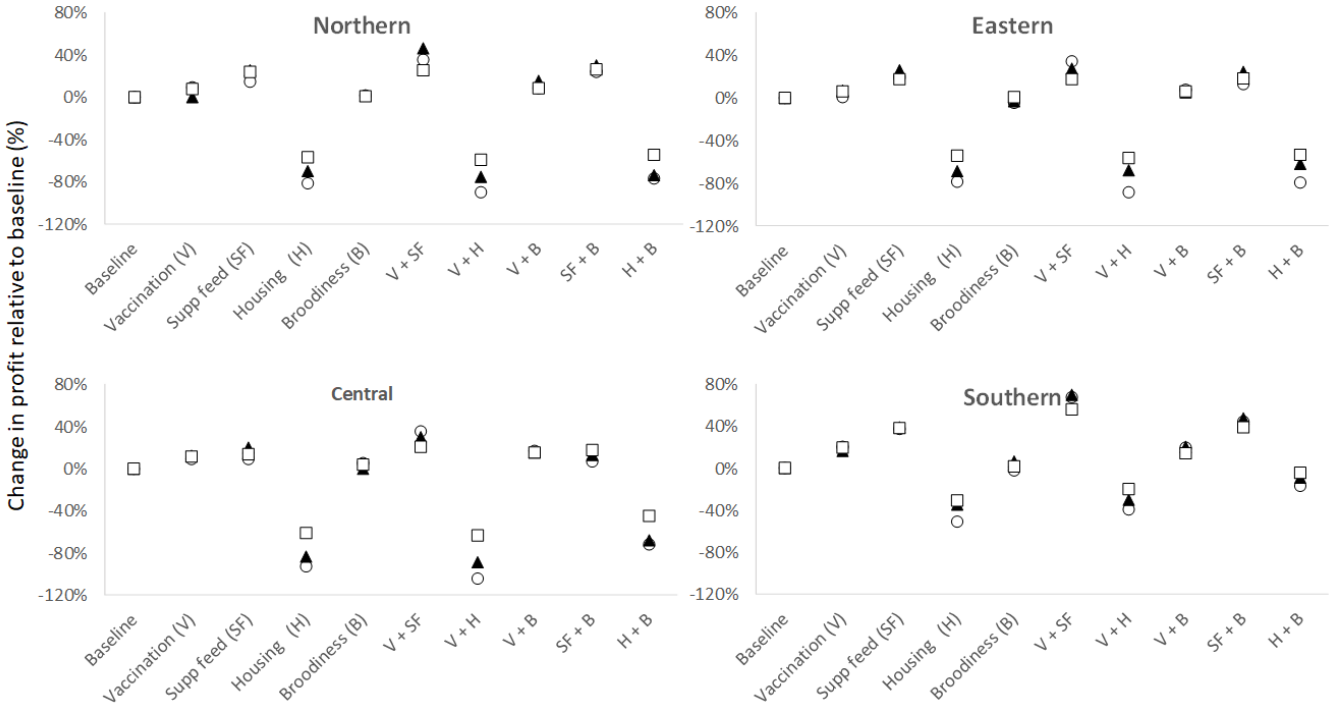
Combined interventions

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

Interventions can increase production and profitability

The baseline median profit varied between regions and ranged between ~ NGN[1] 3,950 to NGN 7,500 per annum. Of the four individual intervention options, supplementary feeding was the most profitable single option across all four regions, as a result of the greatest increase in egg production. Median profits increased by 20-39%, relative to the baseline. While daytime housing resulted in the greatest increase in bird offtake, adopting this option showed negative impact on profitability, with median profits declining by 34-83%.

As dual interventions, Newcastle disease vaccination combined with supplementary feeding (V + SF) resulted in the greatest increase in profit across all four regions, increasing by 28-70%, relative to their corresponding baseline profits.



Percentage change in profit, relative to the baseline, for each intervention option across the four regions of Nigeria. Small flocks (10th percentile) represented by ○, median flocks (50th percentile) represented by ▲, large flocks (90th percentile farms) represented by ☐.

Key messages

Supplementary feeding was the most profitable single intervention option and was most profitable for the medium (50th percentile) flocks. In contrast, daytime housing was unprofitable in all regions, irrespective of flock size, due to additional costs of supplementary feeding and additional infrastructural costs.

Combining supplementary feeding with either vaccination or control of broodiness increased profitability the most across all regions. Therefore, there is merit in identifying ways in which households can obtain inexpensive supplementary feed to increase egg and bird offtake to improve profitability, especially for small to medium producers.

[1]1 USD ~ 367 Nigerian Naira (NGN; March 2020)

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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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