Improving poultry egg production in Tanzania

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

Current production system

Indigenous poultry supply greater than 70% of demand for chicken meat and egg production in rural areas of Tanzania. 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 egg 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 flock size varied between 2-5 birds for the small flocks (10th percentile) through to 27-35 birds for the large flocks (90th percentile), based on the LSMS Survey (2015) data modelled in VIPOSIM (Udo et al. 2006).
- Six regions of Tanzania 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 varied between region only.

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.

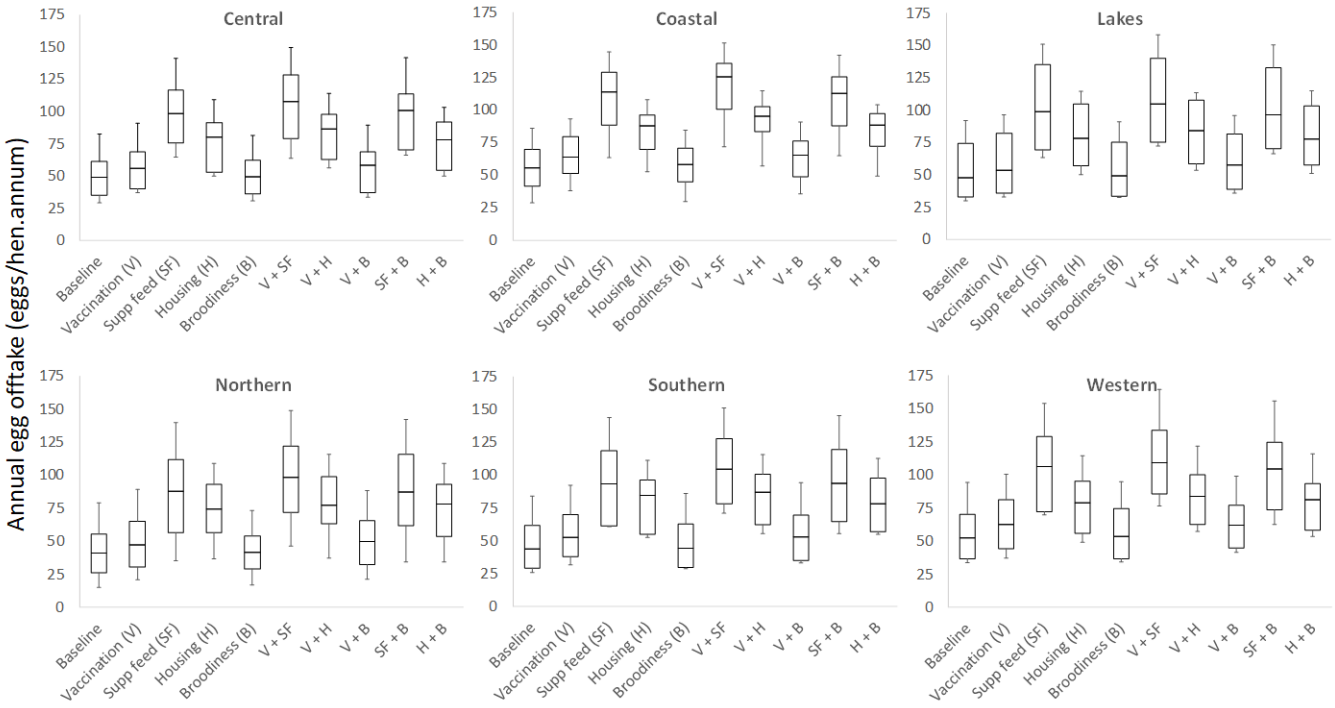
Combined interventions

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

Interventions can increase production

Median egg production (egg offtake as sum of eggs consumed and sold) was 41-55 eggs/hen per annum for the baseline system. All interventions increased egg production across all regions. Supplementary feeding produced the greatest increase in egg production across all regions. Median egg production increased to 88-114 eggs/hen per annum. In contrast, controlling broodiness resulted in marginal changes in egg production.

Supplementary feeding combined with Newcastle disease vaccination (SF + V) increased median egg production to 99-125 eggs/hen per annum. Supplementary feeding and the control of broodiness (SF + B) also resulted in a doubling of egg production, to 87-112 eggs/hen per annum.



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

Key messages

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

Combined interventions can be more successful than single interventions.

Combining supplementary feeding with vaccination resulted in the greatest increase in egg production, and by a rate greater than 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 egg production, relative to the baseline production, declined. This highlights greater benefit of implementing intervention options for small to medium producers.

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References: LSMS Survey (2015) https://microdata.worldbank.org/index.pgp/catalog/2862; Udo et al. (2006) Modelling the impacts of interventions on the dynamics in village poultry systems. Agricultural Systems 88, 255-269.

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