Use of pooled genetic parameters minimizes bias when evaluating response to selection in indigenous chicken breeding program

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Hypothesis

Use of non-pooled genetic parameters from single studies can over or under-estimation of response to selection

Conclusion

1. Genetic gain that results from use of non-pooled parameters is higher than one obtained from pooled parameters

2. Genetic parameters should be subjected to meta-analysis before when simulating breeding programs

Introduction

- Adoption of non-pooled parameters from single studies in evaluation of breeding programs can lead to under or over-estimation of genetic gain
- Alternative pooled parameters through meta-analysis could help overcome this challenge
- This hypothesis was tested by deterministic simulation of breeding scheme resembling that used in chicken production

Methodology

- Two breeding strategies were modelled in a deterministic simulation
- In Non-Pooled Parameters strategy (NNP), parameters were used directly from single studies
- In Pooled parameters strategy (PP), parameters were first subjected to meta-analysis
- Traits in the breeding goal were: Live weight, egg number, age at first egg, antibody response
- **Model;**

$\Delta H = i\sigma_I$

ΔH = Total economic gain in breeding goal
i = Selection intensity
σ_I = Standard deviation of the index

Results

Genetic gain for individual traits, total response (1US$=KES 100), and rate of inbreeding

Trait	Non-Pooled	Pooled
Egg number	-0.410	-0.428
Live weight (grams)	82.932	55.19
Age at first egg	-1.249	0.271
Antibody response	-0.231	-0.206
Total response (US$)	61.10	40.50
Rate of inbreeding (%)	0.49	0.68

- The genetic gain in Non-pooled strategy was 50.86 % higher than one in the Pooled strategy.
- The rate of inbreeding per generation was 38.78 % lower in Non-polled than in Pooled strategy.

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