Immune response of Nigerian chicken genotypes to Salmonella and Newcastle vaccines

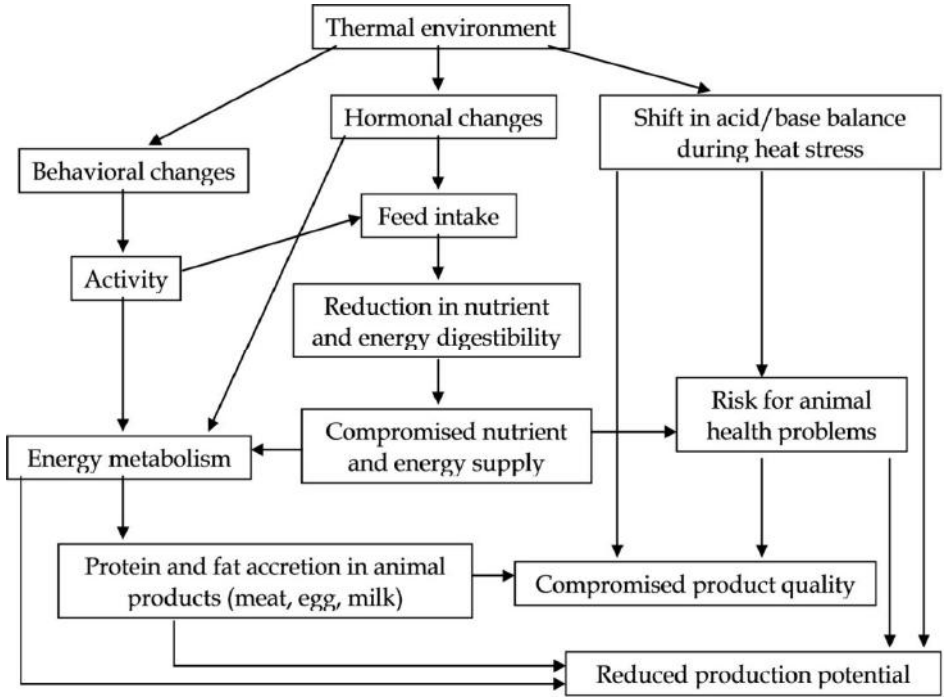
Ikpeme, E. V., Efienokwu, J. N.,* Ekerette, E.E., Duke, M., Ausaji, A. A. and Ozoje M. O.

University of Calabar, Department of Genetics and Biotechnology, Nigeria

SUNDAY 5TH – THURSDAY 9TH AUGUST 2018

Introduction

- Chickens as a source of meat and egg have made significant contributions to household food security throughout the developing world. However, effect of climatic changes and other environmental factors on animal production is a serious course for concern.



Water *- reduced quantity*	• Change in quantity and timing of precipitation affects - Dry areas will get drier and wet ones wetter
Feed *- reduced quality and quantity*	• Land use and systems changes • Decline in productivity of rangelands, crops, forages • Quality of plant material deteriorates • Reduced feed intake Kaptumo, Kenya – climate smart feeding strategies
Changes in the incidence of infectious diseases	• Changes in the patterns and range of infectious diseases • Loss of disease resistant breeds • Increased heat stress, deterioration of immunity

- **Figure 1: Effect of climatic changes on animal production**

Introduction

❖Indigenous chickens have high genetic variance in their performance, hardiness, disease resistance to withstand these environmental stressors (Apuno *et al*., 2011).

❖Local chicken meat is also more appreciated by consumers with reported mild flavour and taste compare to the exotic chickens (Houessionnon, 2011).

❖The importance of local chickens notwithstanding, their production is still far below consumers demand (Tougan *et al*., 2009).

❖The practice of crossbreeding indigenous chickens with the exotic strains in the quest to improve performance has a diminishing effect on genetic abundance of local chickens (Kitalyi, 1998; Gueye and Hooft, 2002).

❖Preliminary Identification and genetic characterization of disease resistance local chicken breeds will be informative in the quest for molecular breeding and genetic improvement of Nigerian local chickens.

Objectives

- ✓ To assess the response of Nigerian indigenous chicken to salmonella vaccine.
- ✓To assess the response of Nigerian indigenous chicken to Newcastle vaccine.
- ✓To estimate the antibody tire volume of three strains of Nigerian local chicken.

Methodology

- A total of 80 chickens were used for the study (30 Normal feather; 25 Frizzle feather; 25 Naked neck).

- Initial blood samples of the chicken were obtained from the wing vein by suction and evaluated for Salmonella and Newcastle antibody titre using widal and tube methods, respectively before vaccination.

- The birds were divided into two groups of 40 chickens each, and treated with Salmonella and Newcastle vaccines, respectively.

Methodology

Frizzle feather

Normal feather

Naked neck

Exotic

Experimental Setting

- Blood samples were collected and analyzed at 3 and 5 days post vaccination.

- The titre record of all the birds were analyzed statistically using ANOVA and significant means were set at 5% significant level.

Results and Discussion

Table 1

Response of chicken genotypes at different duration of exposure to Salmonella vaccine

Duration	Genotypes		
	Frizzle feather	Normal feather	Naked neck
Pre vaccination	$98.25^{a}\pm5.45$	$77.5^{b}\pm17.5$	$71.25^{c}\pm11.25$
3 days post vaccination	$187.58^{a}\pm15.22$	$138.85^{b}\pm15.2$	$128.75^{c}\pm22.79$
5 days post vaccination	$136.25^{a}\pm19.93$	$97.5^{b}\pm8.54$	$95.0^{b}\pm15.0$

Antibody titre was measured in the genotypes 3 days post vaccination with Salmonella vaccine as; 187.58 (frizzle feather), 138.85 (normal feather) and 128.75 (naked neck). These were significant ($p<0.05$) and higher than the titre recorded at pre-vaccination and 5 days post vaccination.

Results and Discussion

Table 2

Response of chicken genotypes at different duration of exposure to Newcastle vaccine

Duration	Genotypes		
	Frizzle feather	Normal feather	Naked neck
Pre vaccination	2.00±0.78	2.01±0.80	1.00±0.05
3 days post vaccination	3.63±0.72	4.13±0.95	3.25±0.53
5 days post vaccination	1.88±0.74	2.88±0.77	3.00±0.66

The 3 days post vaccination with Newcastle vaccine titre for the genotypes were 4.13 (Normal feather), 3.63 (frizzle feather) and 3.25 (naked neck). The were no statistical differences ($p>0.05$) in the response of the different chicken genotypes to Newcastle vaccine.

Results and Discussion

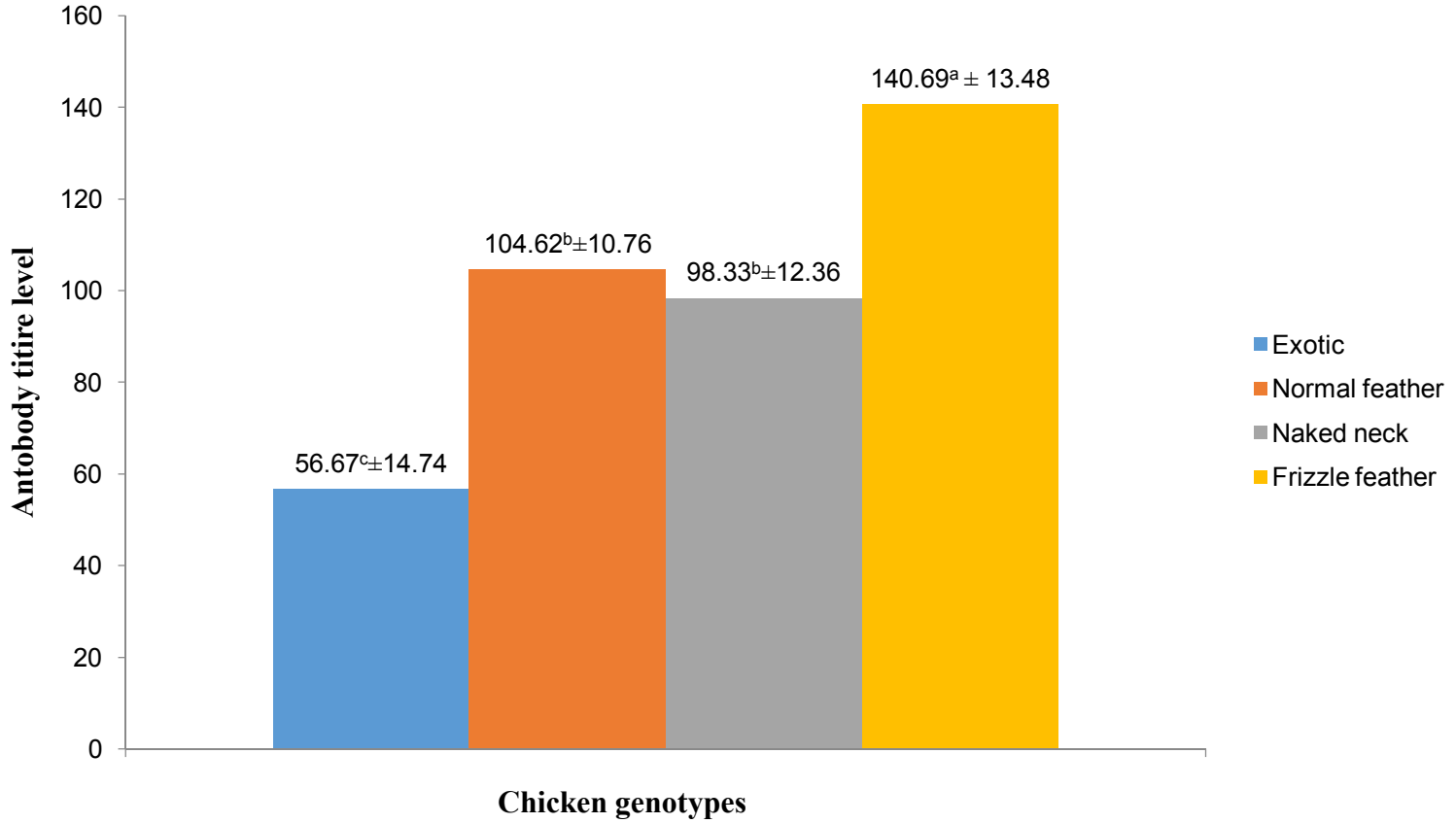


Figure 2: Response of chicken genotypes to *Salmonella* vaccine

The mean total antibody titre of the different chicken genotypes were significantly different ($p<0.05$). The highest was recorded in frizzle feather, followed by normal feather, naked neck and exotic.

Results and Discussion

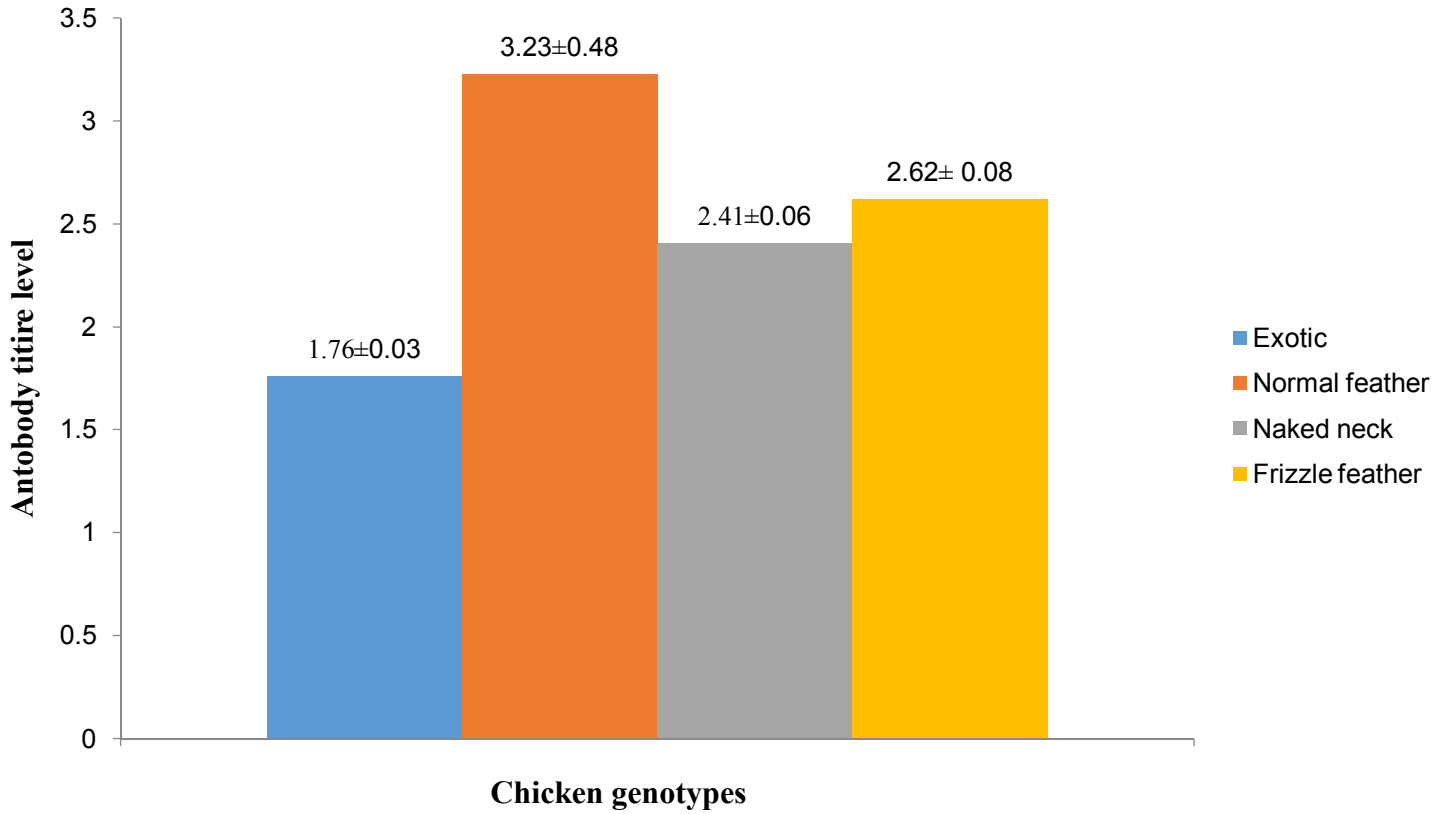


Figure 3: Response of chicken genotypes to Newcastle vaccine

Statistical differences were not recorded for the Newcastle vaccine treated birds (p>0.05)

Conclusions & Recommendations

Following the present results, incorporating routine vaccination into poultry management will be beneficiary to poultry farmers as it will help boost poultry immunity to withstand common diseases.

References

- Apuno, A. A., Mbap, S.T. and Ibrahim, T. (2011). Characterization of local chickens (*Gallus gallus domesticus*) in Shelleng and Song Local Government Areas of Adamawa State, Nigeria. *Agriculture and Biology Journal of North America,* 2(1): 6-14.
- Houessionon, F. J. B. (2011). Typologie des élevages de poulets locaux de l'espèce Gallus gallus en aviculture familiale au Bénin, Mémoire de Master en Production et Santé Animales, École Polytechnique d'Abomey-Calavi, Université d'Abomey-Calavi, 98p.
- Tougan, P.U., Dahouda, M., Salifou, C. F. A., Ahounou, G. S., Kossou, D. N. F., Amenou, C., Kogbeto, C. E., Kpodekon, M. T., Mensah, G. A., Lognay, G., Thewis, A. and Youssao, I. A. K. (2013). Nutritional quality of meat from local poultry population of Gallus gallus species of Benin. *Journal of Animal &Plant Sciences,* 9(2): 2908-2922.
- Kitalyi, A. J. (1998). Village chicken production systems in rural Africa household Food security and gender issues. FAO, Rome.
- Gueye, E. F. and Hooft, Van't, K. (2002). Networking for family poultry development. LEISA, 1 (4): 36.

Acknowledgements

- The authors wish to thank the Animal Genetics and Genomics unit, Department of Genetics and Biotechnology, University of Calabar, Nigeria for the support granted to facilitate this research.

Acknowledgements

- The authors wish to thank the Animal Genetics and Genomics unit, Department of Genetics and Biotechnology, University of Calabar, Nigeria for the support granted to facilitate this research.