



Relationship Between Heat Stress Perception and Adaptation Strategies of Poultry Farmers in Bauchi State, Nigeria

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Introduction

- Temperatures are rising globally as a result of climate change leading to heat stress (Nyoni et al. 2019).
- Heat stress above 30°C generally have a negative effect on chickens and causes a decrease in feed intake and body weight, as well as occasionally a high broiler mortality rate (DAFF, 2013; Tankson et al., 2001).
- For poultry farmers to adjust to those changes they must adapt to different adaptation strategies (Liverpool-Tasie et al. 2018; FAO, 2019).

Objective

To examine the relationship between heat stress perception and adaptation strategies of poultry farmers in Bauchi State, Nigeria.

Methodology

- The research was carried out in the Western Agricultural Zone of Bauchi State, Nigeria, with four local government areas selected (Bauchi, Dass, Tafawa Balewa, and Toro).
- A multi-stage and simple random sampling technique was adopted in selecting 240 respondents from registered poultry farmers for the study.

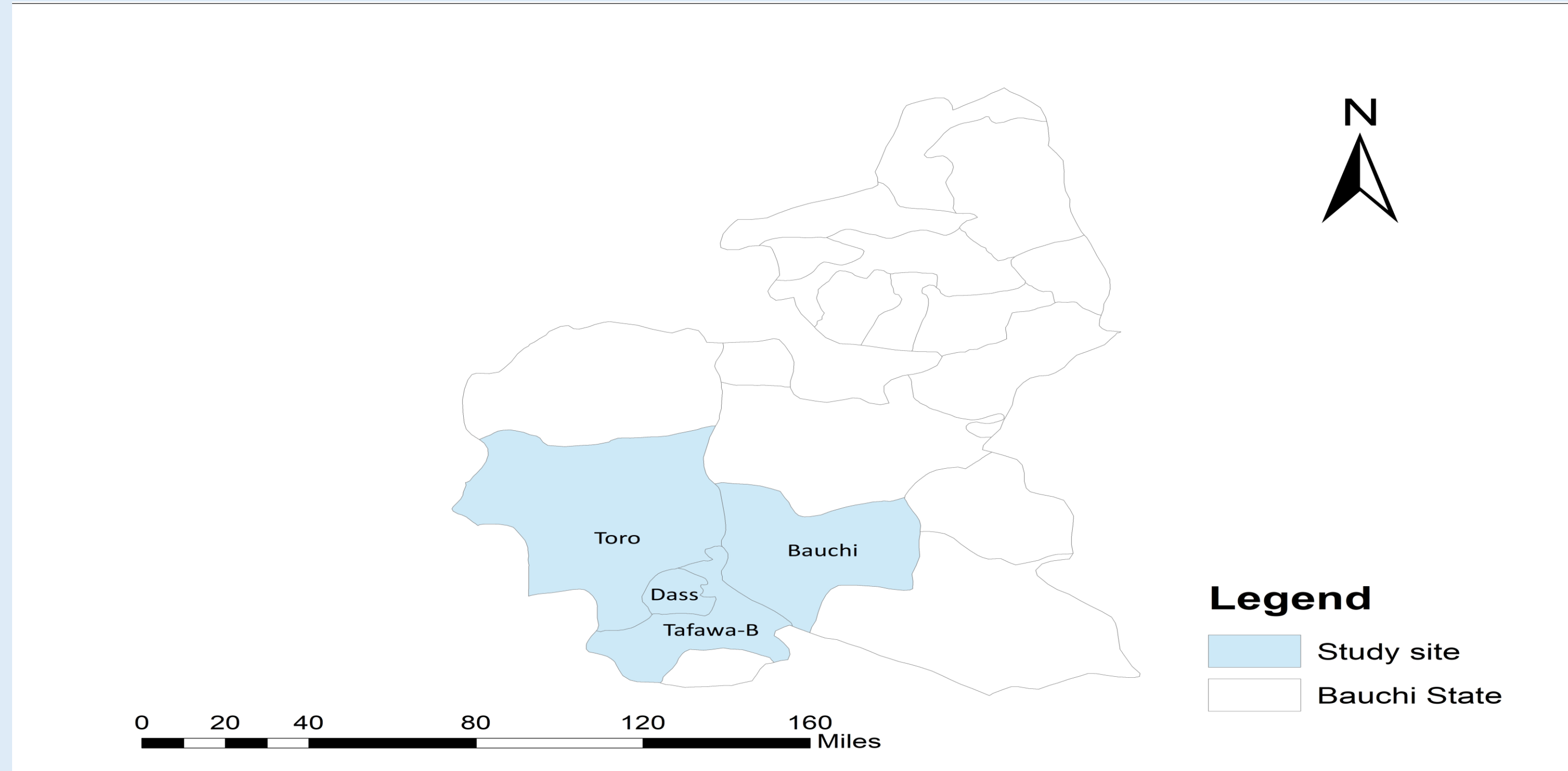


Fig. 1 Map of Bauchi State showing the study area

Result and Discussion

Results: Socio-demographic information of poultry farmers

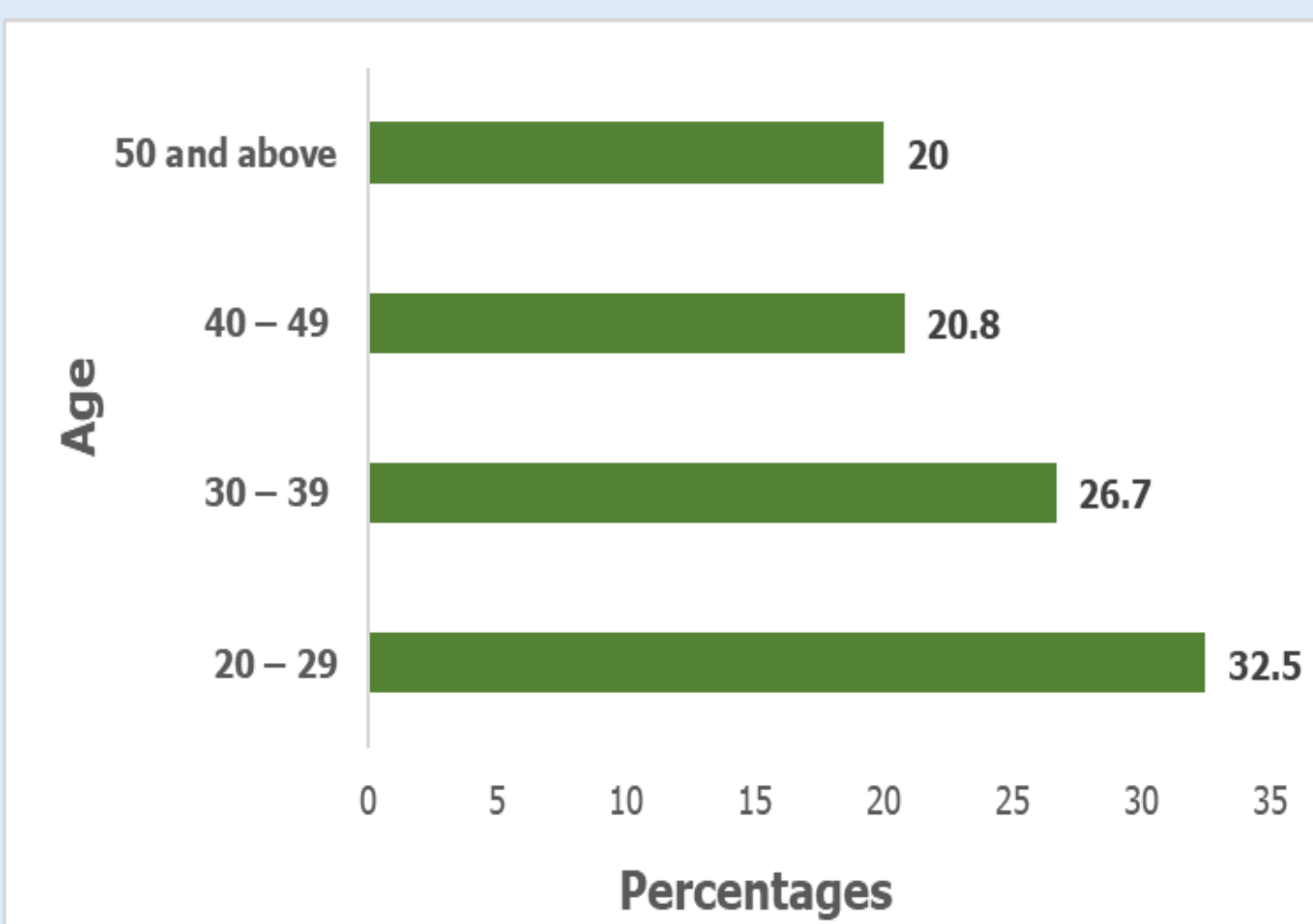


Fig. 2 Age distribution of poultry farmer

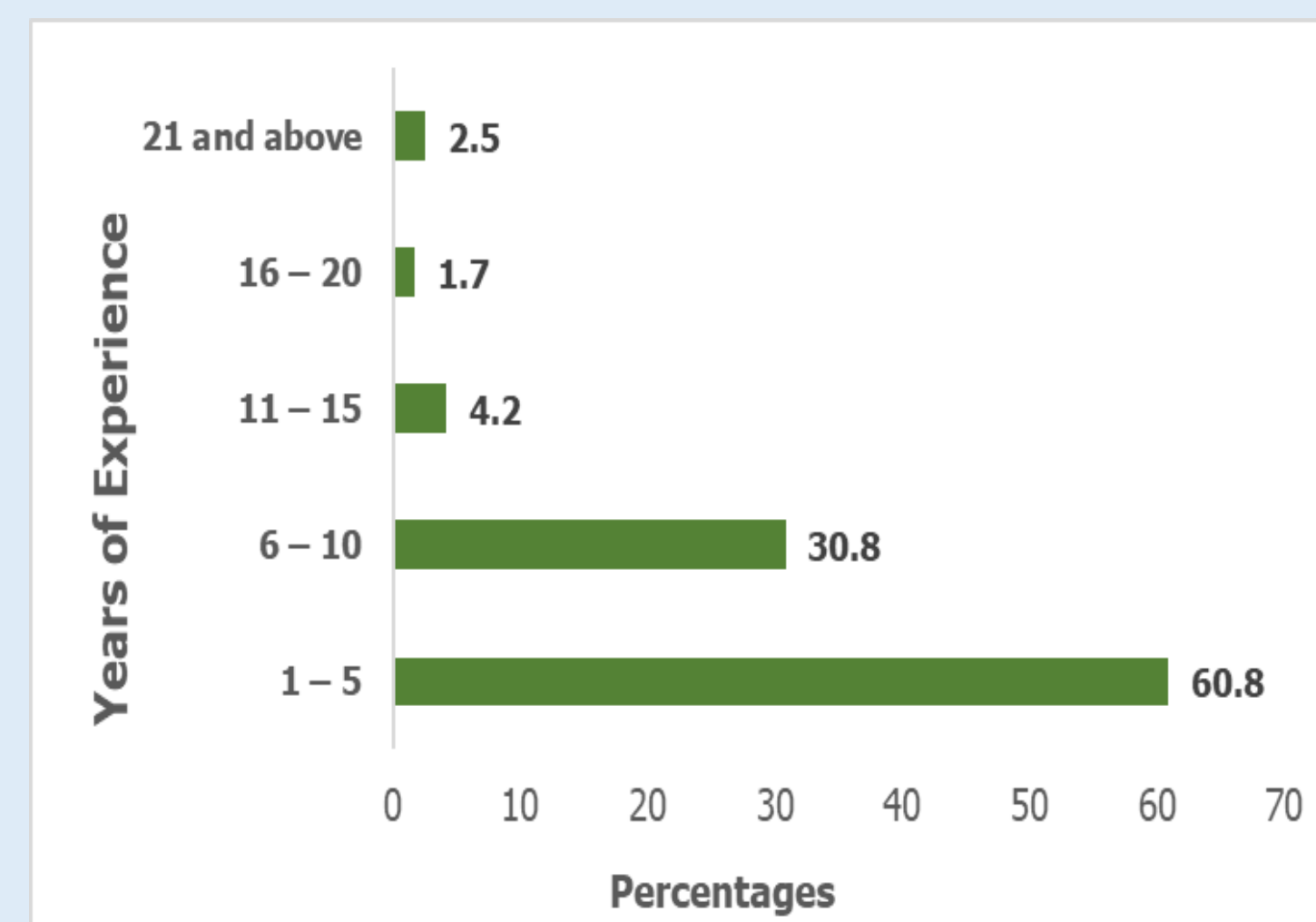


Fig. 3 Distribution of farmers' years of experience

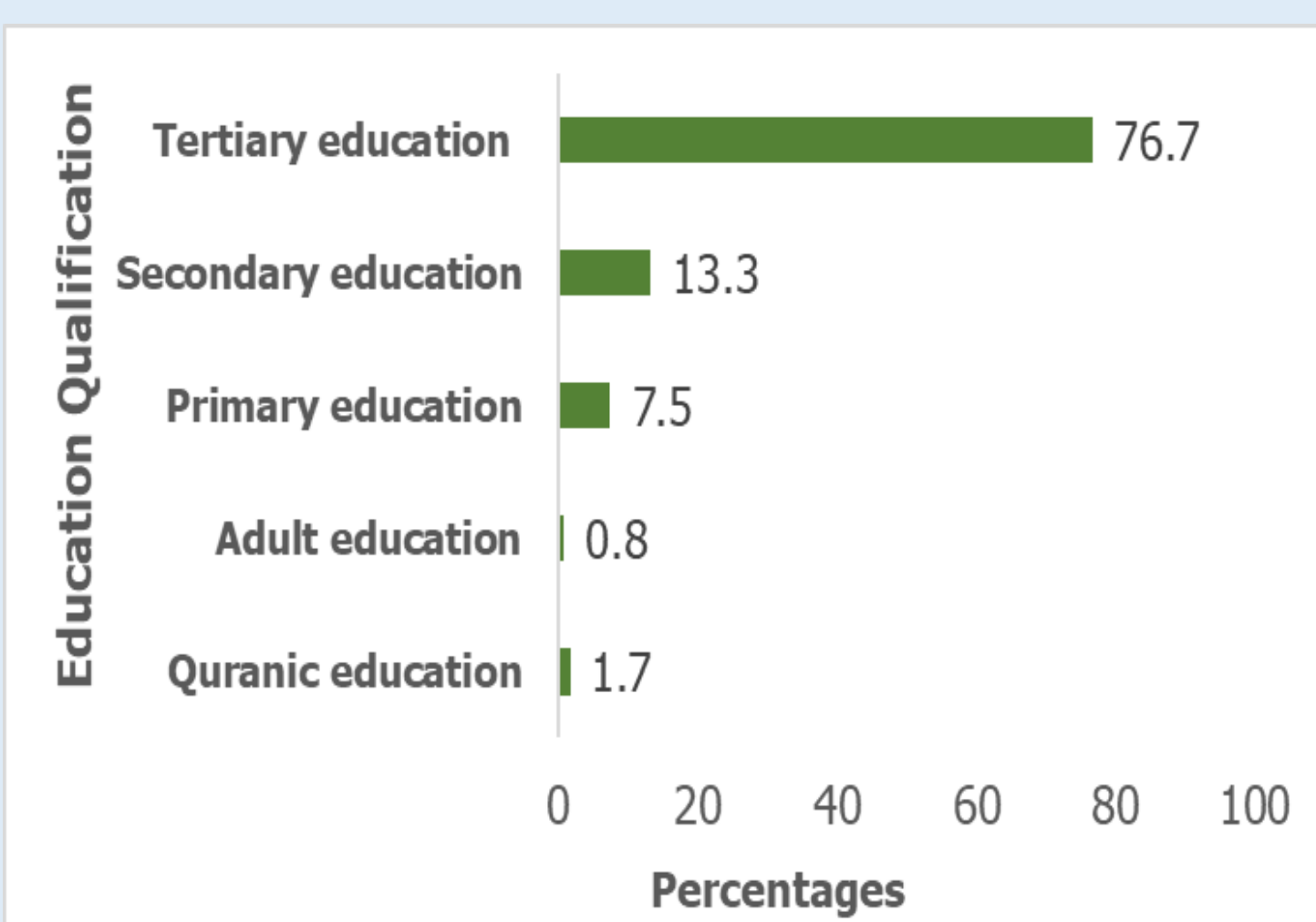


Fig. 4 Distribution of farmer education qualification

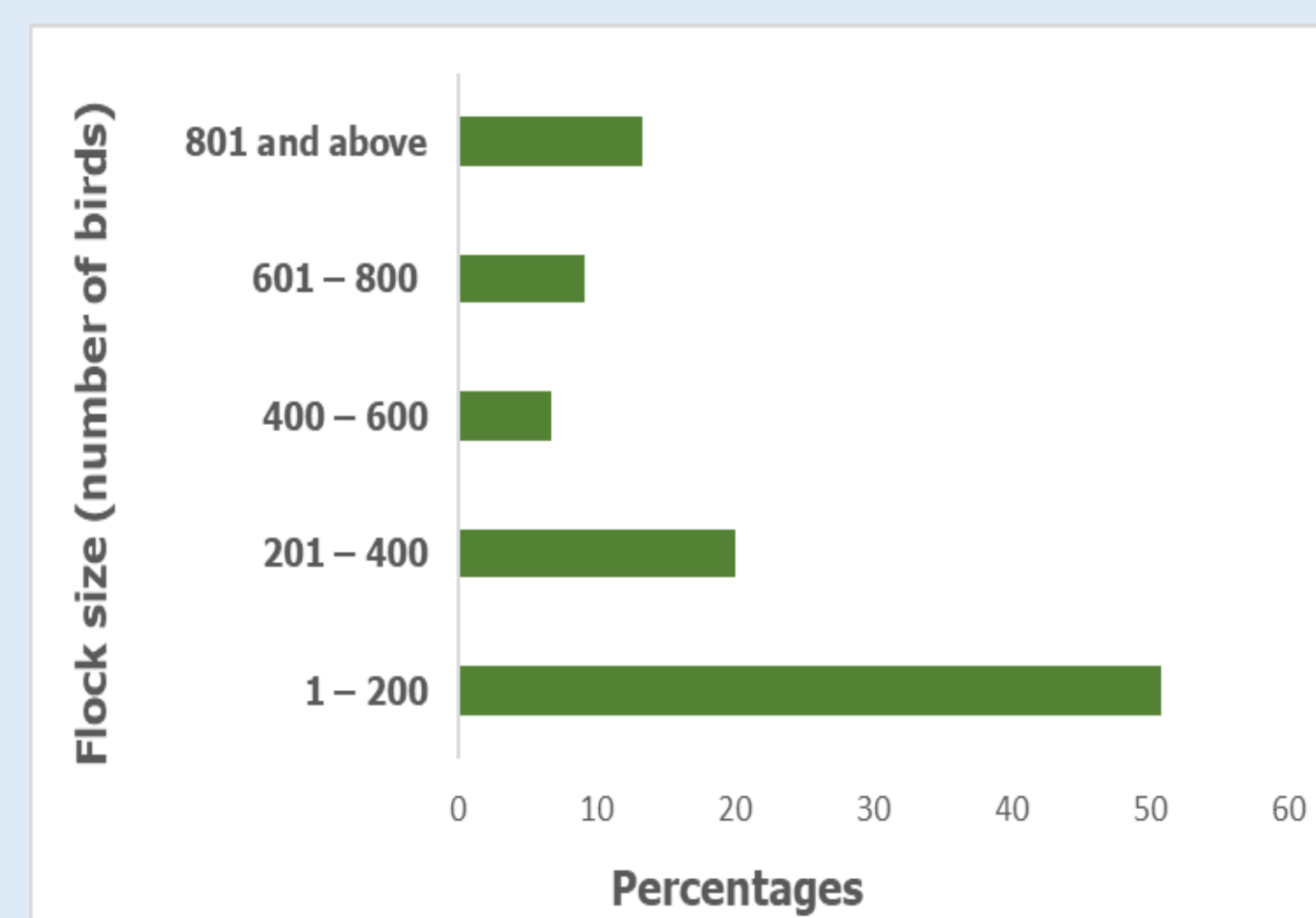


Fig. 5 Distribution of flock size (number of birds)

Result and Discussion

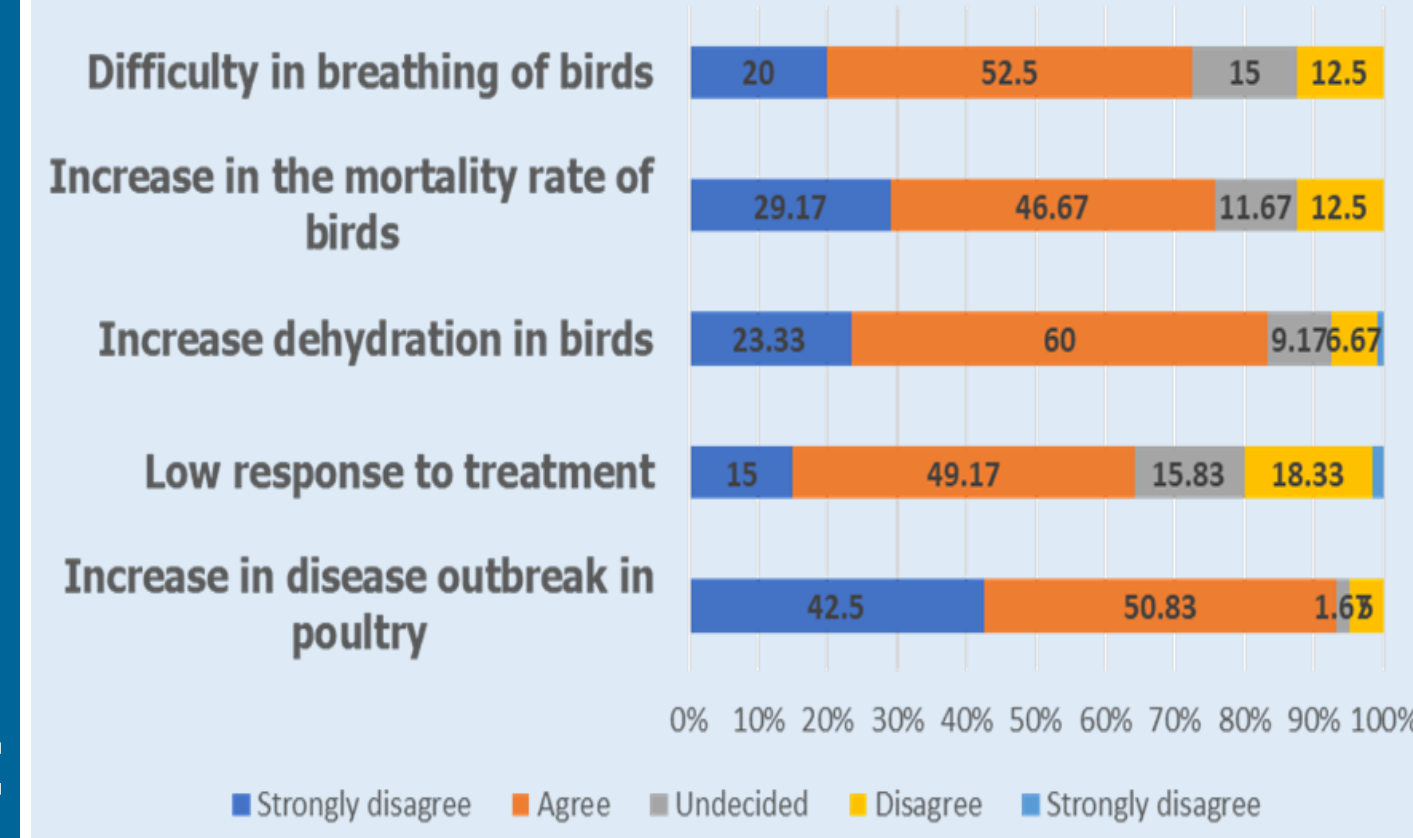


Fig. 6 Perceived effect of heat stress on poultry disease

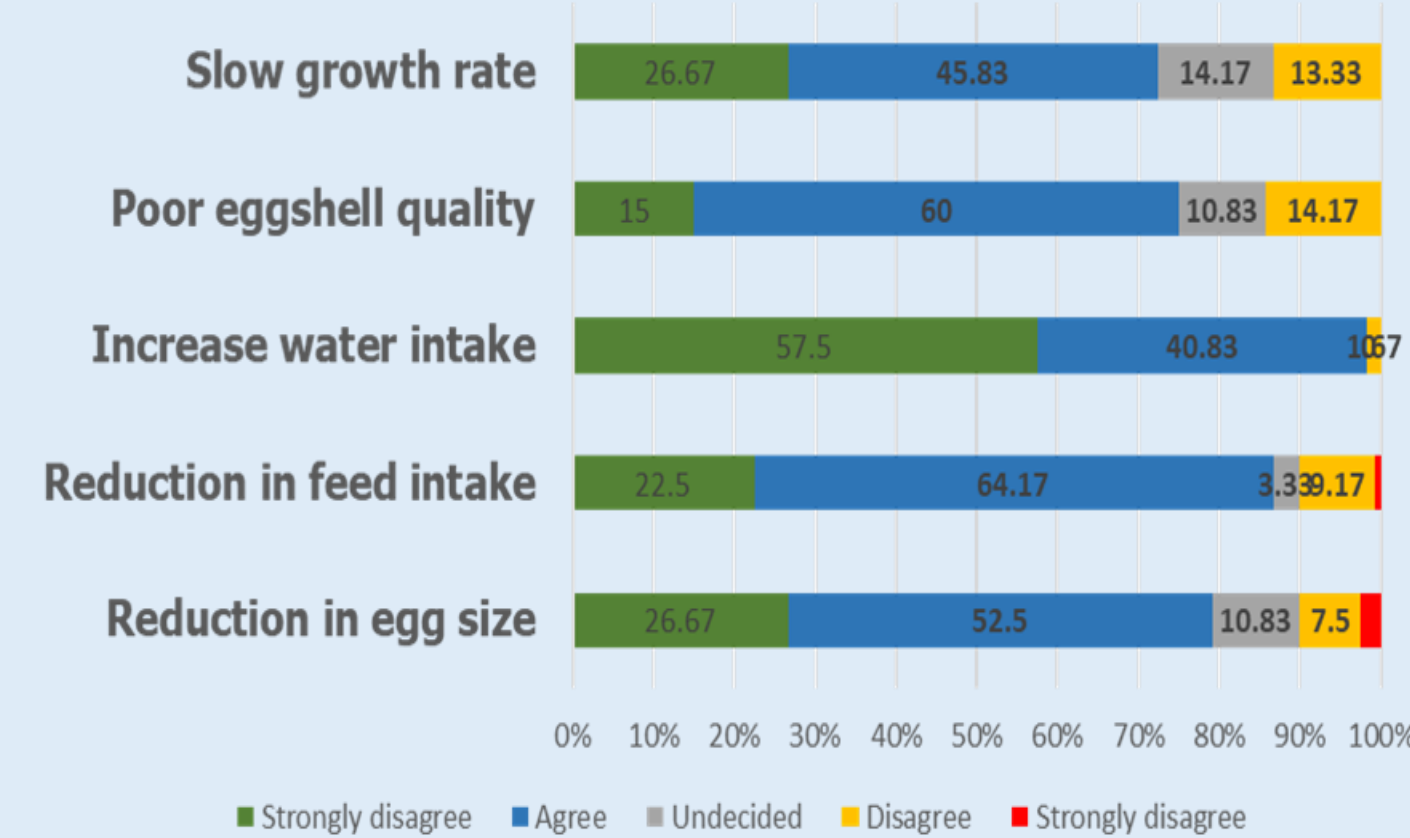


Fig. 7 Perceived effect of heat stress on poultry production

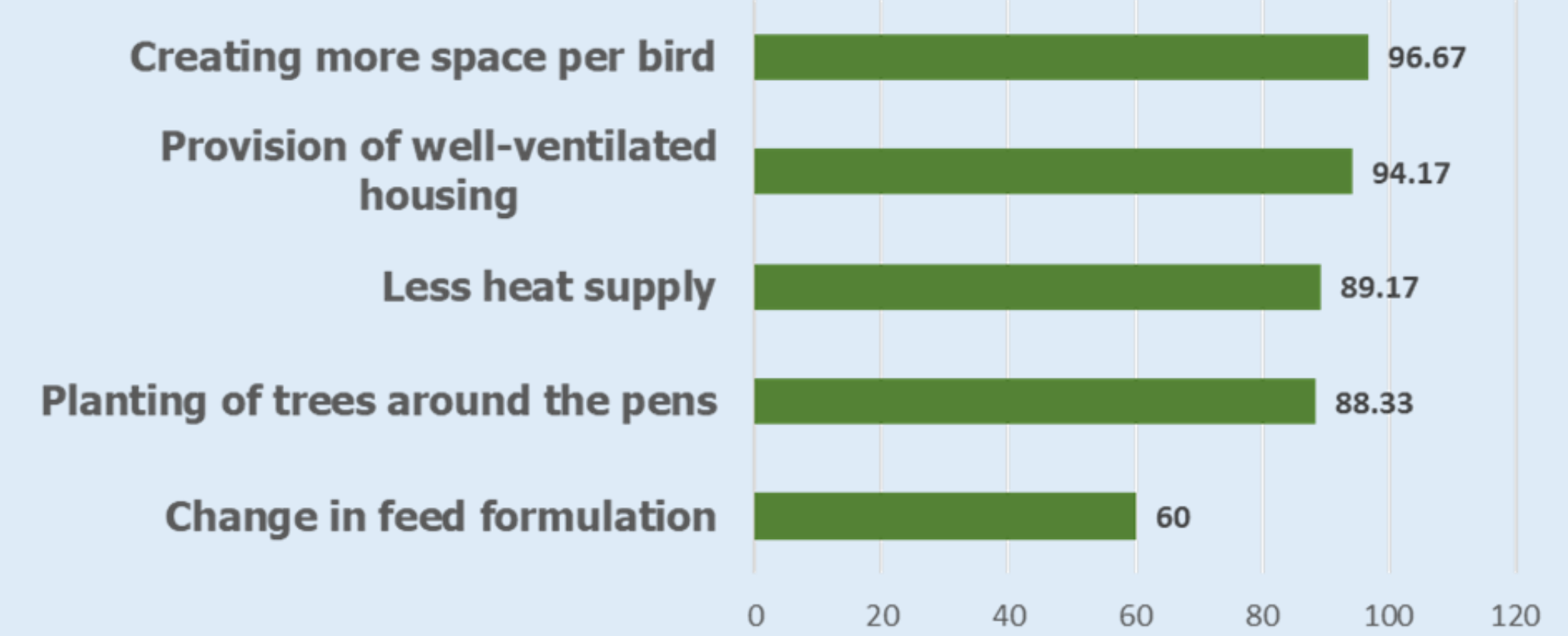


Fig. 8 Adaptation strategies to heat stress by poultry farmers

Table 1. Correlation between perception and adaptation strategies to heat stress (n=240)

Perception	Poor eggshell	Slow growth rate	Increase in temp.	Increase in water intake
Well-ventilated house	0.196**	0.183	0.299**	0.310
Planting trees around pens	0.280	0.145	0.111	0.008
Less heat supply	-0.054	0.002	0.152**	0.191**
Change in feed formulation	0.011	0.234**	0.084	0.150

- Result of the study revealed that majority (75.0%) of the poultry farmers perceived poor eggshell quality, reduction in egg size (79.2%), difficulty in breathing (72.5%), high mortality rate (75.8%) in their poultry.
- Poultry farmers adopted less heat supply (87.2%), planting trees around the pen (88.3%), creating more space per bird (96.7%), change in feed formulation (60.0%) and well-ventilated houses (94.2%).
- The correlation result revealed a positive relationship between slow bird growth rate and feed formulation change ($r^2=0.234^{**}$).
- There is a correlation between temperature increase and provision of a well-ventilated house ($r^2=0.299^{**}$).

Recommendation

- We recommend that poultry farmers acquire more training on heat stress adaptation strategies for poultry sector resilience and to adapt to changing climates.

Acknowledgments

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References

- Nyoni, N. M. B., Grab, S. and Archer, E. R. M. (2019) Heat stress and chickens: climate risk effects on rural poultry farming in low-income countries, *Climate and Development*, 11:1, 83-90, <https://doi.org/10.1080/17565529.2018.1442792>
- FAO (2019). The future of livestock in Nigeria. Opportunities and challenges in the face of uncertainty. FAO, Rome, Italy.
- Liverpool-Tasie, L.S.O., Sanou, A. & Tambo, J.A. (2019). Climate change adaptation among poultry farmers: evidence from Nigeria. *Climatic Change* 157, 527-544. <https://doi.org/10.1007/s10584-019-02574-8>