

## Egg production, quality parameters and sensory attributes of Japanese quails (*Coturnix japonica*) fed low crude protein diet supplemented with lysine

Taiwo Ojediran\*, Sandra Azubuzor, Isiaq kolawole, Motunrayo Afolabi, Damilola Adeola

Ladoke Akintola University of Technology, Department of Animal Nutrition and Biotechnology, Ogbomoso, Nigeria

### References

- ABD EL-MAKSOUND, A. et al. (2011). Performance of local laying hens as affected by low protein diets and amino acids supplementation. In *Egypt. Poult. Sci.*, vol. 31, pp. 249-258.
- ALAGAWANY, M. and MAHROSE, K. M. (2014). Influence of different levels of certain essential amino acids on the performance, egg quality criteria and economics of lohmann brown laying hens. In *Asian J. Poult. Sci.*, vol. 8, pp. 82-96. doi: <http://dx.doi.org/10.3923/ajpsaj.2014.82.96>.
- ALAGAWANY, M. et al., (2014). Effect of low-protein diets with crystalline amino acid supplementation on egg production, blood parameters and nitrogen balance in laying Japanese quails. *Avian Biology Research*, vol. 4, no. 4, pp. 235-243. doi: <http://dx.doi.org/10.3184/175815514X14152945166603ajpsaj.2014.82.96>.
- ANI, A. O. et al. (2009). Response of growing Japanese quails (*Coturnix coturnix japonica*) chicks to diets containing different energy and protein levels. In *Proceedings of the 13<sup>th</sup> Annual Conference of Nigerian Society of Animal Production. Uyo 15-18.3.2009. Uyo, Nigeria: NSAP.* pp. 328-331.
- BAMGBOSE, A. M. and BIOBAKU, W.O. (2003). Utilisation of cotton seed cake as replacement for groundnut cake in layers' diet: Performance and egg quality characteristics. In *J. Pure Appl. Sci.* vol. 3, pp 140-148.
- BAWA, G. S. et al (2011). Responses of Japanese quails to varying dietary protein levels in the Tropics. In *Nig. J. Anim. Prod.*, vol. 38, no 1, pp. 43-54.
- BUNCHASAK, C. et al. (2005). Effect of dietary protein on egg production and immunity responses of laying hens during peak production period. In *Int. J. Poult. Sci.*, vol. 4, pp. 701-708.
- CORZO, A. et al. (2005). Response of broiler chicks to essential and non-essential amino acid supplementation of low crude protein diets. In *Animal Feed Science and Technology*, vol. 118, pp 319-327. doi:<https://doi.org/10.1016/j.anifeedsci.2004.11.007>
- COSTA, F. G. P. et al. (2004). Níveis de proteína bruta e energia metabolizável na produção e qualidade dos ovos de poedeiras da linhagem Lohmann brown. In *Revista Ciência e Agrotecnologia*, vol. 28, no 6, pp. 1421-1427. doi:<http://dx.doi.org/10.1590/S1413-70542004000600027>
- DEMUNER, L.F. et al. (2009a) Níveis nutricionais de lisina digestível para codornas japonesas alimentadas com rações contendo 19,5% de proteína bruta. In: *zootec 2009, associação brasileira de zootecnistas, 5., Águas de Lindóia. Anais... Águas de Lindóia: zootec, 2009a.* Retrieved 2018-2-4 from <http://www.abz.org.br>
- DEMUNER, L.F. et al. (2009b) Níveis nutricionais de lisina digestível em rações de codornas japonesas. In: *zootec 2009, associação brasileira de zootecnistas, 5., Águas de Lindóia. Anais... Águas de Lindóia: ZOOTEC, 2009b.* Retrieved 2018-2-4 from <http://www.abz.org.br>
- DUMONT, M. A. et al. (2017). Crude protein in diets of European quails. *Ciencia Animal Brasileira*, vol 18. doi:<http://dx.doi.org/10.1590/1089-686v18e-28085>
- DUNCAN, D. B. (1955). Multiple range and F-tests. In *Biometrics*, vol. 11, pp. 1-42.
- GARCIA, E.A. et al. (2005). Protein, methionine + cystine and lysine levels for Japanese quail during the production phase. In *Rev. Bras. Cienc. Avic.* vol.7, no.1, pp.11-18. doi:<http://dx.doi.org/10.1590/S1516-635X2005000100002>
- GUNAWARDANA, P. et al. (2008). Effect of energy and protein on performance, egg components, egg solids, egg quality and profits in molted hy-line W-36 hens. In *J. Applied Poult. Res.*, vol. 17, pp 432-439. doi:<https://doi.org/10.3382/japr.2007-00085>.
- HEMID, A. F. A. et al. (2010). Alleviating effects of some environmental stress factors on productive performance in Japanese quail laying performance. *World Journal of Agric. Sci.*, vol. 6, pp. 517-524.
- KHAJALI, F. et al. (2008). Production performance and egg quality of Hy-line W36 laying hens fed reduced-protein diets at a constant total sulfur amino acid: Lysine ratio. In *J. Applied Poult. Res.*, vol. 17, pp. 390-397. doi:<https://doi.org/10.3382/japr.2008-00002>.
- MANJU, G. U. et al. (2015). Effect of supplementation of lysine producing microbes vis-à-vis source and level of dietary protein on performance and egg quality characteristics of post-peak layers. *Vet world*, vol. 8, no. 4, pp. 453-460.
- MURAKAMI, A.E. et al. (1993) Levels of protein and energy in diets of laying Japanese quails (*Coturnix coturnix japonica*). In *Revista de Sociedade Brasileira de Zootecnia*, vol. 22, no 4, pp 541-551.

NOVAK, C. et al. (2008). Response to varying dietary energy and protein with or without enzyme supplementation on leghorn performance and economics. 2. Laying period. In *J. Applied Poult. Res.*, vol. 17, pp. 17-33. doi:<https://doi.org/10.3382/japr.2006-00126>

OJEDIRAN, T.K. et al. (2017). Blood parameters, carcass yield, organ weight and villi morphometrics of broilers fed low protein diet in excess of dietary lysine. In *Trakia Journal of Sciences*, vol. 2, pp. 121-127. doi:[10.15547/tjs.2017.02.004](https://doi.org/10.15547/tjs.2017.02.004)

NRC (1991). National Research council. Quail. In: *Microlivestock – Little known small animal with a promising future*. Nation. Academy Press. Washington D. C. pp. 147-155. doi: <https://doi.org/10.17226/1831>

PANDA, A.K., et al. (2010). Replacement of normal maize with quality protein maize on performance, immune response and carcass characteristics of broiler chickens. In *Asian-Aust. J. Anim. Sci.*, vol. 23, pp. 1626-1631.

PINTO, R. et al. (2003) Lysine requirements for laying Japanese quails. In *Revista Brasileira de Zootecnia*, vol. 32, pp.1182-1189. doi: <http://dx.doi.org/10.1590/S1516-35982003000500019>.

SAS (2000). SAS/ STAT Guide for personal computers version and Edition, Cary, North Carolina, SAS Insitute; 2000.

SHITTU, T.A. and OGUNJIMI, O. (2011). Effect of low cost shell coating and storage conditions on the raw and cooked qualities of shell egg. In *CyTA-Journal of Food*, vol. 9, no. 1, pp. 34-50. doi:<https://doi.org/10.1080/19476330903450423>.

SKLAN, D. and PLAVNIK, I. (2002) Interactions between dietary crude protein and essential amino acid intake on performance in broilers. In *British Journal of Poultry Science*, vol. 43, no. 3, pp. 442-449. doi:<https://doi.org/10.1080/00071660120103710>

TEGUIA, A. and BEYNEN, A. C. (2004). Nutritional aspects of broiler production in smallholder farms in Cameroon. In *Livestock Research for Rural Development*, vol. 16, no 1, Art. #17. Retrieved February 26, 2018, from <http://www.lrrd.org/lrrd16/1/tegu161.htm>

TULEUM, C. D. et al. (2013). Performance and erythrocyte osmotic membrane stability of laying Japanese quails (*Coturnix coturnix japonica*) fed varying dietary protein levels in a hot humid tropics. In *Agriculture and Biology Journal of North America*, vol. 4, no. 1, pp. 6-13. doi:10.525/abjna.2013.4.1.6.13

WU, G. et al. (2005). Effect of dietary energy on performance and egg composition of Boven White and Dekalb White hens during phase 1. In *Poult. Sci.*, vol. 84, no. 10, pp. 1610-1615.