Title: Liveability and Growth of Turkey Poults Fed Honey Early Post Hatch

Authors: R. Adejumo1,2,a, T. Makanju2,3, I. Adebowale2 and A. Agboola2

1. Nigerian Institute of Animal Science, Nigeria

2. Department of Animal Science, University of Ibadan, Ibadan, Nigeria

3. Department of Animal Health and Production Technology, Oyo State College of Agriculture and Technology

a. Corresponding author: tundeadejumo@yahoo.co.uk

Application: Liveability of turkey poults was enhanced when 5% honey solution was fed early post hatch

Introduction: Excessive depletion of glycogen during hatching has been shown to negatively impact growth and may increase early mortality in young turkeys (Lingens *et al.,* 2021). Studies have indicated that higher blood glucose levels are associated with increased glycogen concentrations and accelerated growth in turkey embryos and hatchlings (Wang *et al*., 2023). The young hatchlings' ability to survive in the first several days after hatching when they are adjusting to a high-energy diet, relies on glycolysis. Karabagias *et al*. (2014) states that carbohydrates make up the majority of honey's dry weight, accounting for approximately 95%, while water and various minor components are present in smaller quantities. Therefore, effects of early post hatch feeding of honey on liveability and water consumption of turkey poults were investigated.

Materials and Methods: Two hundred and forty (n=240), one-day old turkey poults were randomly assigned to: untreated water (control), 5% glucose, 1% honey and 5% honey solutions for three days early post hatch and raised for four weeks in six replicates of 10 eggs each. Liveability, water consumption (mL/bird), Average Daily Feed Intake-ADFI (g/poult/day), Average Daily Weight Gain-ADWG (g/poult/day) and Feed Conversion Ratio-FCR were calculated. Data were analysed using descriptive statistics and ANOVA (SAS 2013) and means were separated using Duncan’s Multiple Range Test α0.05.

Results: The result of feeding honey early post hatch on performance of turkey poults at week 0 to 4 was as presented in Table 1. The final weight, average daily feed intake and average weight gain showed no significant difference from the control when honey solution was fed. Feed conversion ratio was significantly (P < 0.05) reduced (2.55) in birds that received 5% honey early post hatch. Liveability was also significantly (P < 0.05) increased (93.80%) when 5% honey solution was fed early post hatch although the value was similar to that of poults that received 5% glucose and 1% honey. The result of feeding honey early post hatch on water consumption of turkey poults in the first three days early post hatch was as presented in Table 2. At day 1, values obtained for water consumption were significantly higher (P < 0.05) and similar to the control except poults on 5% glucose (75 mLs) which had the highest value. Significantly higher (P < 0.05) values were also recorded for water consumption on day two with the highest value recorded in poults that received 5% honey (182 mLs). At day 3, poults that received 5% glucose (233 mLs) and 5% honey (264 mLs) had the higher (P < 0.05) values for water consumption than poults that received 1% honey which was similar to the control.

**Conclusion**: Early post hatch feeding of 5% honey enhanced liveability and utilisation of nutrients. Finding a perfect alternative way to augment or maintain a glucose balance during the early post hatch phase has potential of producing a very healthy poults with good liveability.

Table 1: Effects of feeding honey early post hatch on performance of turkey poults (week 0-4)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Treatment | Control | 5% Glucose | 1% Honey | 5% Honey | SEM | P-value |
| Initial weight (gbird) | 50.82 | 51.53 | 51.78 | 52.14 | 0.17 | 0.033 |
| Final weight (g/bird) | 270.93 | 282.17 | 284.14 | 314.00 | 8.61 | 0.351 |
| ADFI (g/bird/day) | 26.72 | 28.53 | 24.41 | 23.84 | 0.91 | 0.240 |
| ADWG (g/bird/day) | 7.86 | 8.24 | 8.30 | 9.35 | 0.31 | 0.377 |
| FCR | 3.48a | 3.51a | 3.03ab | 2.55b | 0.15 | 0.071 |
| Liveability (%) | 76.91b | 91.79ab | 89.64ab | 93.80a | 2.78 | 0.124 |

a,b Means on the same row with different superscripts are significantly (P < 0.05) different. ADFI-Average Daily Feed Intake, ADWG-Average Daily Weight Gain, FCR- Feed Conversion Ratio

Table 2: Effects of feeding honey early post hatch on water intake of turkey poults

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Day/mL Consumed** | **Control** | **5% Glucose** | **1% Honey** | **5% Honey** | **SEM** | **P-value** |
| Day one (mL/bird) | 27.00c | 75.00a | 51.00b | 50.00b | 6.31 | 0.048 |
| Day two (mL/bird) | 42.00c | 140.00ab | 108.00b | 182.00a | 14.90 | 0.001 |
| Day three (mL/bird) | 156.00b | 233.00a | 171.00b | 264.00a | 12.68 | 0.001 |

a,b,c Means on the same row with different superscripts are significant P ≤ 0.05

**References**

Hegazi, A., Abdou, A. M. & AbdulAllah, F. (2013). Influence of honey on immune response against newcastle disease vaccine. *Biology* 2(1):1-5

Lingens, J. B., Abd El-Wahab, A., Ahmed M. F. E., Schubert, D. C., Sürie C. & Visscher, C. (2021). Effects of early nutrition of hatched chicks on welfare and growth performance: a pilot study. *Animals (Basel)*. 11(10):2888

SAS Institute, (2013). SAS/STAT User’s Guide. Release 9.30 editions. SAS Institute Inc., Cary, North Carolina

Wang, H., Zhu, Y. W., Yang, J., Wang, X. Y., Zhan, Y. C., Wang, W. C. & Yang, L. (2023). Research note: Developmental changes of glucose metabolism are associated with insulin signaling in goose embryo. *Poultry Science*, 102(5):102204

Karabagias, I. K., Badeka, A., Kontakos, S., Karabournioti, S. and Kontominas, M. G. (2014). Characterization and classification of *thymus capitatus (l.)* honey according to geographical origin based on volatile compounds, physicochemical parameters and chemometrics. *Food Research International*, 55: 363–372