has predisposed the birds for the outbreak of Necrotic enteritis.

Summary

Outbreak of Necrotic enteritis in a layer flock of 10000 birds was investigated. Clostridium perfringens organisms were isolated and identified. Mortality rate of 27 per cent was recorded. Symptoms manifested were recorded. Gross and histopathological lesions were documented. In situ presence of both clumps of C. perfringens organisms as well as A. galli in the mucosa of the intestine was observed.

References


Effect of Different Dietary Lysine and Methionine Levels on Egg Quality Traits in Layer Japanese Quails (Coturnix coturnix japonica)*

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Japanese quail, a small-domesticated avian species, has assumed importance world wide as laboratory bird and is presently commercially exploited for meat and egg production. The popularity of quail eggs has increased in India. The present investigation was carried out on the effect of different dietary lysine and methionine levels on egg quality traits in layer Japanese quails under hot and humid climatic conditions.

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Materials and Methods

A biological experiment was conducted using Japanese quails (Coturnix coturnix japonica) from day old to thirty weeks of age to identify the dietary lysine and methionine requirements of layer Japanese quails. One thousand and two hundred straight run Japanese quail chicks belonging to the same hatch were reared from 0 to 6 weeks of age under the deep litter system.
Lysine and methionine supplementation to layer Japanese Quails

The birds were fed with brother mash of 24 per cent dietary protein with dietary metabolizable energy level of 2750 kcal/kg and later shifted to a lower dietary energy and protein level of 2600 kcal/kg and 20 per cent respectively. At the end of sixth week, 468 female Japanese quails were randomly chosen and placed in layer cages. All the 468 female birds were fed with a constant metabolizable energy level of 2700 kcal/kg and dietary protein of 19 per cent respectively. Female Japanese quails were randomly allotted to 9 treatments in layer cages. Each treatment comprised of 52 birds with two replicates of 26 birds each. The first three treatments had a constant dietary lysine level of 0.95 per cent and next three treatments with dietary lysine level of 1.05 per cent and last three treatments with dietary lysine of 1.15 per cent with 0.35, 0.40 and 0.45 per cent DL-methionine (T1, T2, T3, T4, T5, T6, T7, T8 and T9) respectively.

The eggs collected for 3 consecutive weeks of 10th, 20th and 30th weeks period were utilized for the measurement of external and internal egg quality traits. The weights of each egg, albumen, yolk and shell were recorded to 0.01 g accuracy. The length and width of the eggs were measured using dial caliper with 0.05 mm accuracy. Shape index was worked out according to the formula of Shutttz (1953). From egg weight (g) and volume of egg (ml) the specific gravity was calculated as: Specific gravity = Weight of the egg (g)/Volume of the egg (ml).

After breaking open the egg, the height of the thick albumen and yolk was measured to 0.01 mm accuracy using an “Ames tripod micrometer” and the width of the thick albumen was measured at two places using a dial caliper with 0.05 mm accuracy and their mean width was arrived at. Albumen index was calculated according to the formula of Heiman and Carver (1936). Yolk index was calculated according to the formula of Sharp and Powell (1930). A modified version of Haugh unit by Kondaiah et al. (1983) was used. Yolk colour was visually compared to the colour numbers in the Roche yolk colour fan. The shell thickness was measured at three places by using a shell thickness measuring gauge with 0.01 mm accuracy and the mean shell thickness was calculated. The per cent albumen, yolk and shell was calculated in relation to egg weight and expressed as percentage. The egg shell percentage was calculated by using the following formula: Percentage of egg shell = Shell weight (g)/Egg weight (g) x 100

**Results and Discussion**

The overall average egg weight was 12.25 ± 0.02 g. The dietary lysine and methionine groups of 0.95/0.45 and 1.15/0.45 recorded significantly (P<0.01) higher egg weight of 12.69±0.08 g and 12.68±0.06 g respectively. Between periods, later period of 27-30 weeks of age recorded significantly (P<0.01) higher egg weight. The smallest egg was laid by young layer Japanese quails aged 7-10 weeks (11.77±0.05). This was highly significant (P<0.01). Older birds laid significantly heavier eggs. 0.45 per cent dietary methionine recorded significantly (P<0.01) higher egg weight of 12.57±0.04 g. Sehu et al. (2005) observed that increased dietary methionine levels increased egg size. The overall mean shape index was 78.24±0.14. The dietary lysine and methionine combinations had significantly (P<0.01) influenced shape index. Conversely, Eishu et al. (2005) found no effect of dietary lysine and methionine on shape index. Ten week old layer quails recorded significantly (P<0.01) higher shape index of 79.19±0.26. The group fed with 1.15 per cent dietary lysine during lay recorded significantly (P<0.05) higher shape index (78.58±0.24). Layer Japanese quails fed with 0.35 per cent dietary methionine recorded significantly (P<0.01) higher shape index. The overall mean specific gravity of layer Japanese quail egg was 1.052±0.002. The dietary lysine and methionine combinations did not influence significantly the specific gravity of eggs, while between periods, highly significant (P<0.01) difference was observed. Highest specific gravity was recorded
in eggs laid by Japanese quails 10 weeks of age (1.065±0.002). Individually, dietary lysine did not have any significant effect on the specific gravity.

Layer Japanese quails fed with 0.35 per cent dietary methionine recorded significantly (P<0.01) eggs with highest Specific gravity of 1.058±0.00. A positive correlation was observed between these two interactions.

The overall mean albumen index, yolk index, Haugh unit score and yolk colour score of the Japanese quail egg were 0.103±0.001, 0.413±0.002, and 84.56±0.16. The 10th week period produced significantly (P<0.01) a higher albumen index, yolk index and Haugh unit score of 0.107± 0.002, 0.439 ± 0.003 and 86.05 ±0.37. While, 0.35 percent dietary methionine group had significantly (P<0.01) the highest Haugh unit score (85.14±0.29). There was no significant difference in yolk colour score between treatments, periods and individual dietary lysine and methionine levels respectively. The different dietary lysine and methionine combinations did not have any significant effect of albumen index, yolk index and Haugh unit score. Age had a significant (P<0.01) effect on albumen and yolk index and Haugh unit score. Young layer Japanese quail (10 weeks) recorded significantly (P<0.01) higher albumen and yolk index and Haugh unit score. The overall mean egg shell thickness was 0.207±0.001mm. The various dietary lysine and methionine combinations significantly (P<0.05) influenced shell thickness 0.95/0.45 combination recorded significantly (P<0.01) the lowest shell thickness. 10-20 week old Japanese quails recorded significantly (P<0.01) higher egg shell thickness. Age and dietary methionine and lysine combination had a significant effect on shell thickness.

The overall albumen and yolk percent was 59.79±0.05 and 31.68 ± 0.02. Between periods, there was a significant (P<0.01) difference. Layer Japanese quails aged 20 to 30 weeks recorded significantly (P<0.01) higher albumen percent. Neither dietary lysine and methionine combinations, nor periods or individual amino acids significantly influenced yolk percent. The dietary lysine and methionine combinations had no significant effect on per cent albumen and yolk, also individual amino acids did not significantly influence albumen or yolk per cent. Older Japanese quails aged 30 weeks of age had significantly higher albumen per cent (60.21 ± 0.05). Yannakopoulos and Tserveni-Gousi (1986) observed that egg weight was positively correlated with albumen weight. Per cent shell was not influenced by any of the combinations of dietary lysine and methionine nor by individual lysine or methionine.

Summary

The present study was carried out dietary lysine and methionine requirements of layer Japanese quail and revealed that egg weight was higher in 0.95/0.45 and 1.15/0.45 lysine and methionine groups. Period of 27-30 weeks of age recorded significantly (P<0.01) higher egg weight. Ten week old bird’s eggs recorded significantly (P<0.01) higher shape index, albumen index, yolk index and Haugh unit score. 10-20 week old Japanese quails recorded significantly (P<0.01) higher shell thickness. 20-30 weeks Japanese quails recorded significantly (P<0.01) higher albumen per cent.

References

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