EFFECT OF FEEDING TIME ON HATCHABILITY AND QUALITY OF HATCHLINGS FROM BROILER BREEDERS RAISED UNDER TROPICAL ENVIRONMENT

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Abstract

A total no of 240 Marshal Broiler chicken breeder flocks during 40th to 48th weeks of age were used to determine the effect of feeding time on the hatchability and quality of hatchlings raised under tropical environment. The feeding schedule was divided into 3 treatments 3am, 5am and 7am respectively having 3 replicates in each treatments with 20birds per replication. Data obtained were subjected to a completely randomize design. Feeding time had no significant variation between the percentage hatched chicks. The 3am (96.39) and 5am (96.32) treatments are significantly (P<0.05) different from the 7am treatment (90.53). The feeding time 3am and 5am has a higher hatchability percentage compared to the 7am feeding time. However, significant (P>0.05) difference were not observed in the total hatched chicks, but a numerical difference was seen across the treatments with 3am and 5 am recording a higher numerical difference compared to the 7am feeding time. Feeding time has no significant difference on the quality of hatchlings. Hence, it could be concluded that birds fed at 3am and 5am has a higher hatchability performance.

Keywords: Broiler breeder, hatchability, feeding time

Introduction

The production and supply of day-old chicks is very important for the success of the poultry production chain. Commercial operations depend on hatcheries for the supply of day-old chicks while the subsistence farmers hatch their chicks by natural incubation King'ori (2011). Selection for high growth rates, efficiency, and yield in broilers has allowed the poultry industry to enjoy many intended benefits. According to Zuidhof *et al*. (2014). There have also been unintended consequences, and a prime example is the challenge of allocating feed to parent stocks, which is faced daily by hatching egg producers. Feeding time seems to have the potential to influence the performance of adult broiler breeder flocks and it is thus of great importance (Backhouse and Gous, 2006). Formerly, feeding breeders in the late afternoon was a standard procedure, but latter studies show that choice of feeding time for adult breeders can influence the production of settable eggs, egg shell quality, fertility and hatchability (Leeson and Summers, 2009). Hence, this study aim to determine the effect of early hours of feeding on the hatchability of broiler chicken breeders and the quality of their hatchlings.

Materials and Methods

Experimental Site

The research was conducted at Obasanjo Farms Nigeria Ltd. Breeder Farm, Igboora, Oyo State; situated in the rain forest zone of Nigeria, on latitude $7^{1}43^{0}$N and longitude $3^{1}28^{0}$E.

Experimental Birds

The experiment was conducted using 240 Marshal Broiler breeder flocks during 40th to 48th weeks of age. These birds were randomly assigned to 3 treatment groups, with four replicates per treatments. The birds were housed in a fenced hall, with cages equipped with nipple drinker system. Room's cleaning and disinfection programs was carried out in accordance with current standards. The experiment lasted for a period of ten weeks, allowing the birds to get accustomed to the new feeding pattern for the first two weeks of experiment. The remaining eight weeks was used for data collection, scheduling the first four weeks of the experiment for the feeding time, eggs collected from the birds for the first four weeks were stored and taken to the hatchery. The second four weeks was then used for the monitoring of the eggs in the hatchery and the stages of the embryonic development.

Feeding Schedules

Three feeding schedules was applied, 3.00am (as control), 5.00am and 7.00am. All treatments were fed once a day at varying time of feeding and with 135g of feed per bird per day. Treatment 1 were fed at 3.00am, the 2nd treatment at 5.00am and the 3rd treatment at 7.00am. All treatments were replicated four times to contain 20 birds per replicate.

Data Collection

Percentage hatchability

This will be calculated by the formula below:

$$\% \text{ Hatchability} = \frac{\text{total hatched chicks}}{\text{Number of fertile eggs}} \times 100$$

Chick Quality Assessments

Ten chicks will be picked at random from each treatment, the score for each parameter observed will be recorded. For each chick, the score will be added up and then deducted from the maximum score which is 10, the average will then be calculated. The parameters to evaluate include the following;

1. Chick Vitality: if when the chick is made to lie on its back, if it sit up immediately (score=0). If it takes more than 3 seconds to sit up (score=1).
2. Navel: the navel is normal when it is completely closed and all yolk is absorbed (score=0). If navel is open and/or a dried cord can still be seen (score=1).
3. Hock Joint: if the hock joint is not enflamed and have a normal colour (score=0). But if the hock joint is enflamed and/or red (score=1).
4. Abdomen: the size of the abdomen depends on the size of the yolk sac and is essentially linked to temperature and humidity in during incubation. If the chick has a soft abdomen (score=0), but if the abdomen is hard and the skin is stretched (score=1).
5. **Statistical Analysis**

6. Data obtained will be subjected to completely randomized design. Significantly ($p<0.05$) different means among variables will be separated using Duncan's multiple range test as contained in SAS (2002)

Results and Discussion

Table 1 shows the effect of feeding time on the hatchability of the incubated eggs of broiler breeder chicken fed at different time of the day. There is a significant variation between the percentage hatched chicks. The 3am (96.39) and 5am (96.32) treatments are significantly ($p<0.05$) different from the 7am treatment (90.53). The feeding time 3am and 5am has a higher hatchability percentage compared to the 7am feeding time. However, significant ($p>0.05$) difference were not observed in the total hatched chicks, but a numerical difference was seen across the treatments with 3am and 5 am recording a higher numerical difference compared to the 7am feeding time.

This result is however in contrast to the finding of Metin Petek (2006) who reported that birds fed during the late hours of the morning and afternoon records a higher hatchability performance. Also Mc Daniel et al., (1979) and Brake (1988) also reported that afternoon feeding improves hatchability.

Table 2 shows the effect of feeding time on the quality of the hatchlings of broiler breeder chicken fed at different time of the day. There was no significant ($p>0.05$) difference in the average chick weight, vitality of the chicks, navel, hock, beak, and abdomen with the difference in the time of feeding.

Conclusion

From this study, it could be concluded that birds fed at 3am and 5am had a better hatchability performance when raised under tropical environment.

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Table 1; Effect of Feeding Time on the Hatchability of Broiler Chicken Breeder Eggs Raised under Tropical Environment.

Feeding time	3am	5am	7am
Parameters			
Egg laid	90.31± 3.89	84.84± 4.76	79.69± 2.71
Egg set	34.00±2.68	32.25±2.56	31.25±2.56
Fertile egg	28.50±2.72	28.75±1.38	28.00±1.47
% fertile eggs	87.30±2.91	89.83±2.90	90.36±3.53
Infertile eggs	3.00±0.41	2.75±0.48	2.75±0.25
% infertile eggs	9.04±1.43	8.56±1.33	9.12±1.36
Hatched chicks	27.50±2.72	27.75±1.75	25.25±0.75
% hatched chicks	96.39±0.37[a]	96.32±1.57[a]	90.53±2.52[b]

[a,b:] Means on the same row having different superscript are significantly ($p<0.05$) different.

Table 2: Effect of Feeding Time on the Quality of Hatchlings of Broiler Chicken Breeder Eggs Raised under Tropical Environment.

Feeding time	3am	5am	7am
Parameters			
Avg. chick wght	41.73±0.91	42.08±0.71	39.93±1.35
Vitality	2.00±0.41	2.50±0.50	1.75±1.18
Navel	0.75±0.48	0.25±0.25	0.75±0.25
Hock	0.00±0.00	0.00±0.00	0.00±0.00
Beak	0±0	0±0	0±0
Abdomen	0±0	0±0	0±0