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THE EFFECTS OF TIME BETWEEN HATCHING AND PLACEMENT ON EARLY GROWTH RATE OF BROILER CHICKENS

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Abstract

This study aimed to assess how the time gap between hatching and placement affects the early growth rate of broiler chickens. A total of 120 ROSS 308 broilers were acquired from Kano and randomly divided into three groups, each containing four replicates. They were provided with commercial feed. Group 1 started feeding on the day of arrival, while groups 2 and 3 were withheld from feed for 2 and 3 days, respectively, before beginning to eat. The experiment was conducted over a two-week period, examining parameters such as body weight, feed intake, feed conversion ratio, weight loss, and growth percentage. Birds that were fed after 2 and 3 days lost an average of 2.43g and 3.40g of their initial weight, respectively. Group 1 experienced significantly ($p>0.05$) better final, total, and daily weight gains, followed by group 2, while group 3 showed the least growth. However, feed consumption was highest in group 1 and lowest in groups 2 and 3, with group 1 also exhibiting a superior feed conversion ratio and growth percentage. The findings indicate that early feed availability improves the performance of chicks.

Description of Problem

The objective of any poultry farmer is to achieve the required flock performance in terms of bird welfare, live weight, feed conversion ratio, uniformity and meat yield within the unique economic constraint of the operation. Optimal broiler performance and profitability depend on chick quality, health, bird welfare, nutrition, temperature, water supply, feed supply, vaccination schedule, ventilation, stocking density and lighting [1]. However, one factor that is usually not taken serious is the time to transport chicks on the farm after hatching. Although newly hatched chicks rely initially on their yolk sac for nutrients and immunity, but what happen in swift or late transition to external feeding? It is when the chicks are placed on the farm that the issue of correct hosing, environment and management take effect. Under normal condition after hatching, other procedures such as sexing, sorting, vaccination and packing prolongs the fasting period of chicks [2]. In regions with hot climates or where environmental controlled vehicles are unavailable, the practice has been to transport chicks in the coolest pat of the day and as such birds movement are delay till evening time, hence making transit period longer. It has been earlier reported that some chicks arrived on farm 2-5 days with their counterparts taken elsewhere [3]. In a scenario where it is not possible to minimize the time between hatching and placement, it becomes a serious concern and this should not be overlooked or inadequately addressed because it has multiplying negative effect on the early performance of chickens. Owing to the short generation interval of broiler chickens, everyday must be accountable. Therefore, these studies assess the effects of time between hatching and placement on early growth rate of broiler chickens.

Materials and Methods

The house was pre-heat and the temperature was stabilized at least 6 hours prior to the arrival of chicks. Litter was evenly spread at an appropriate depth (2-4 cm) using wood shavings. Feed and water were made available to chicks immediately. Light was provided 23 hours for the first 7 days to encourage feed and water intake. The feeders and drinkers were appropriately spread for easy to access feed and water. Sanitation and hygiene were strictly observed. One hundred and twenty day old chicks of ROSS 308B strain were purchased from Kano, Kane State. They were randomly distributed into 3 groups after their initial weight was determined; each group had 4 replicates of 10 chicks each.

The first group were supplied with feed on arrival day and continued *ad libitum*. The second and third groups were supplied with feed after being fasted for 2 and 3 days respectively and on commencing feeding they were supply with the feed also *ad libitum*. In each group, water supplied *ad libitum*. At the end of two week the replicate group weights were determined. Total weight gain was calculated by subtracting the initial from weight at 14 days. Daily weight gain was determined by dividing total gain by 14 for each replicate. Daily feed intake was determined by subtracting leftover from supply. Cumulative daily feed consumed gave total feed intake (TFI). The TFI divided by 14 gave daily feed intake. Feed conversion ratio was determined by dividing the total feed intake by total weight gain. Reduction in weight prior to feed consumption for those in group 2 and 3 was determined by reweighing the weight what obtained was subtracted from the initial weight. Percent growth rate was determined by dividing the live weight at 14 days by the initial weight. Mortality was not recorded.

The data obtained on body weight, feed intake and feed conversion were subjected to one-way analysis of variance using SPSS version 25 statistic. Differences observed were reported at $p>0.05$.

Results and Discussion

Table 1 shows the performance of broilers at 1 week of age at differently placement time. There was no significant different in the initial weight. Significant differences were observed in the entire growth matrix. It is important to note that the birds that were denied feed for 2 and 3 days were observed to loss 2.43g and 3.40g weight respectively. The birds that commenced feed consumption at day-old showed superior growth rate in terms of higher final weight, total weight gain and daily weight gain followed by those that commenced feed consumption at 2 days of age while those that began feed consumption at 3 days showed lower growth rate. This result implies that denying broilers feed consumption reduces their live body weight because they need extra day to replace the lost weight, hence their performance cannot be compared to which commenced feeding at the right time. This finding supports the assertion by [4] who that a longer delay in feed and water consumption post hatch negatively affect chick quality and subsequent performance. However, feed consumption was higher in the birds that began feed consumption at day-old than those that started on day 2 and 3 this is due to more days of consumption. It can also be explained that the higher gain in the birds beginning feed consumption at day 1 of age is perhaps due to their higher feed intake. This supports the finding of Dibner et al. [5] that gain is a dependent of input. The better feed conversion ratio in the birds placed on day 1 indicates that early commencement of feeding leads to efficient performance as evident by gaining 4.5 times the initial weight while lower gains for those on day 2 and 3 (3.8 and 3.2% respectively). The percent growth rate in the birds that started feeding on day is similar to 4.5 recorded by Prabaka *et al*. [6]. Mortality was not recorded supporting the assertion that birds can successfully be sustained on egg yolk in the early days of life [1]. It has been reported Chicks have survived 4 days of feed restriction [3]. It has been established that residual yolk is used up more quickly in chicken which had access to feed immediately after hatch than those fasted for first 48 h [7]. Noy *et al*. [3] reported that poults fed with post hatch feed had higher intestinal weight (3.5 g) as compared to fasting birds (3 g). Chicks with access to feed consumed

6.5 g of feed in first 48 h post hatch and body weight increased by 5 g. Early feeding has a great effect in triggering the right momentum of growth in broiler hatchlings. Early nutrient supply to chicks is essential to increase the intestinal mechanical activity, faster intestinal development, greater assimilation of feed, development of immunity and thereby overall growth performance [6]. Several investigations have shown that chicken weight at 6-7 weeks of age had the linear relationship with their weight in the first week [8] and it was not due to the breeder age and day old chicken weight [9]. Hastened growth rate was observed by Nobakht [10] following feeding chicks with pre-starter feed before starter feed. Broiler feeding in the first few days of life is one of the priorities that could affect growth, feed efficiency, uniformity and finally more profit to farmers [1].

Table 1: Performance of chicks at 1 week of age at differently placement time

Parameters	Arrival day	2 days on arrival	3 days on arrival	±SEM	p-value
Initial weight (g)	44.44	44.95	44.51	0.28	0.996
Reduction in weight prior to feed consumption (g)	0.00	2.43	3.40	-	-
Final weight (g)	199.98^{a}	170.81^{ab}	142.43^{b}	28.77	0.045
Weight gain (g)	155.54^{a}	125.86^{b}	97.92^{c}	28.81	0.012
Daily weight gain (g)	22.22^{a}	17.98^{b}	13.99	4.12	0.014
Total feed intake (g)	189.44^{a}	181.38^{a}	171.15^{ab}	9.17	0.037
Daily feed intake (g)	27.06^{a}	25.91^{a}	24.45^{b}	1.31	0.220
Feed conversion ratio	1.22^{b}	1.44^{ab}	1.75^{a}	0.27	0.061
% growth rate	4.50	3.80	3.20	-	
% Mortality	-	-	-	-	-

Note: The chicks were purchased in open market where the exact hatching date was not certain.

Conclusion and Application

This study concluded that proper early nutrition and management influence higher growth rates in chicks. It is recommended to minimize the time between hatching and chick placement whenever possible

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