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EFFECTS OF POST-HATCH FEEDING INTERVALS ON GROWTH PERFORMANCE AND APPARENT NUTRIENT DIGESTIBILITY OF BROILER CHICKENS

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ABSTRACT

Post-hatchfeeding intervals effects on the performance and nutrient digestibility of Hubbard broiler chickens was carried out using two hundred and eighty (280) Hubbard strain of broiler chicks. The birds were weighed and randomly distributed into seven (7) treatments of four (4) replicates each with ten (10) birds per replicate in a completely randomized design. The birds in Treatment 1 were fed 8h, birds in Treatment 2 were fed 10h, birds in Treatment 3 were fed 12h, birds in Treatment 4 were fed 24h, birds in Treatment 5 were fed 36h, birds in Treatment 6 were fed 48h and birds in Treatment 7 were fed 60h post-hatch respectively. The experiment lasted for 8 weeks. Apparent nutrient digestibility trial was also carried out at the 8th week of the experiment.Results shows that the final weight (1901.33g) was highest in Treatment 3 while the lowest value (1665.59g) was obtained in Treatment 7. Similar trend was observed for the daily weight gain. The highest daily feed intake (77.86g) was obtained in Treatment 1 while the lowest value (64.15g) obtained in Treatment 5. The feed: gain ratio value obtained in Treatment 1 is higher (2.54) than the values obtained across other Treatment (T2 – T7 and the lowest value (2.05) was obtained in Treatment 4 which is similar to 2.05 and 2.10 obtained in Treatments 2 and 3respectively. It was concluded, that post-hatch feeding has significant effect on the performance characteristics and treatment 3 (Feeding 12hrs after hatching) had signicatly higher final weight but had no significant effect on nutrient digestibility except nitrogen free extract.

Key words: Apparent nutrient digestibility, broiler chickens, feeding interval, feed intake, performance

INTRODUCTION

Apart from differences in hatching time which usually compel hatchery to pull out chicks when majority have hatched, the hatchery management operations in addition to transportation of the newly hatched chicks usually cause the early hatched chicks to be deprived of feed for a longer duration (Batal and Parsons, 2002, Tamboli *et al.,* 2018). These are not without some consequences, for instance Panda *et al.*(2015) reported that an increased post-hatched holding period has detrimental effects on the chicks due to potential dehydration and energy depletion and that delayed placement of chicks along with delayed feeding has relationship with lower weight gained and higher mortality, poor response to vaccination, slow gastrointestinal tract and immune system development, poor resistance to diseases and pathogens as well as the long time performance of the newly hatched chicks. The importance of early feeding therefore cannot be overemphasized. Early acess to nutrients is essential for a sound immunity and improved health of chicks and poults (Dibner *et al* .,1998). Immediate post-hatch provision of nutrition (feed and water) has been suggested to improve intestinal development (Lilburn and Loefler, 2015). It was also indicated that feeding hatchlings immediately post-hatch increase body weight of the chicks and poults with reduced mortality (Dibner and Knight, 2003; Yi *et al*., 2005 and Henderson *et al*., 2008). This experiment was carried out to determine the effects of interval of post-hatch feeding intervals on the performance of Hubbard broiler chickens.

MATERIALS AND METHODS

The experiment was carried out at the Poultry and Research unit of the Teaching and Research farm, Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria.

Experimental Animals and Management

Twohundred and eighty (280) day old Hubbard strain of broiler chicks were used for the experiment. The birds were weighed at the commencement of the experiment and randomly distributed after weight-balancing into seven (7) treatments of four replicates each.The birds in Treatment 1 were fed 8h, birds in Treatment 2 were fed 10h, birds in Treatment 3 were fed 12h, birds in Treatment 4 were fed 24h, birds in Treatment 5 were fed 36h, birds in Treatment 6 were fed 48h and birds in Treatment 7 were fed 60h post-hatch respectively. Each replicate had ten (10) birds to make a total of 40 birds per treatment. Each replicate was housed in a pen with dimension of 90cm x 90cm x122cm. The birds were managed intensively and all necessary vaccinations and medications were administered as and when due. Daily routines required for healthy flock were also observed throuhgout the 8 weeks of experiment.

Data was collected on : Daily Feed Intake in gramme (Feed offered – Left over),

Daily Weight Gain: $\text{Daily weight gain} = \frac{\text{Total weight gain weekly}}{\text{Number of days in a week}} / (g)$

Feed to Gain Ratio: $\text{Feed to gain ratio} = \frac{\text{Total feed intake}}{\text{Total weight gained}}$

Feed Cost/kg Weight Gain (determined by multiplying the value of the feed cost per kg with feed to gain ratio in naira.

Experimental diets (3029.83 kcal/kg ME and 21.33% Crude Protein for starter phase) and (2824.38 kcal/kg ME and 19.38% crude protein for finisher phase) was formulated and used.

Apparent nutrient digestibility Trial:The digestibility trial was carried out in metabolic cagesat eight weeks. The fecal samples were then collected for three days following three days of acclimatization. Records of feed offered, leftover feed, feed intake, wet and dry weights of the collected faecal samples were recorded. The collected faecal samples was carefully wrapped in foil paper and oven dried, samples per replicate were bulked together and sub-samples were taken for proximate analysis. Nutrient digestibility was calculated thus,

$$\text{Nutrient Digestibility} = \frac{(\text{Nutrient in Feed Intake} - \text{Nutrient in Faecal Output}) \times 100\%}{\text{Nutrient in Feed Intake}}$$

Laboratory Analysis: Proximate composition of the diet used and faecal samples was analysed at the end of the experiment according to the procedure of AOAC (2005)

Statiscal Analysis: Data collected were analysed using one way analysis of variance of the General Linear Model of SAS (2003) softfware package. Duncan's option of the same software was used to compare the means.

RESULTS AND DISCUSSION

The metabolizable energy and crude proteins of the diet for the starter and finisher phases are adequate and similar to the range used by Nawaz *et al. (*2006). The performance characteristics of the broilers is presented in Table 1. Final weights, daily weight gain, daily feed intake , feed to gain ration as well well feed cost per kg weight gained were significantly affected. Juul maadsen (2004) observation on broilers subjected to the first 24h feed deprivation without affecting normal performance is similar to result obtained in study. However Bhanja *et al*. (2009), observation that chicks fed immediately after hatch gained 10.5% more weight than those feed deprived after 48h is contrary to the results of these findings in which a 0.02% reduction in weight. The results obtained in this experiment is not in agreement with the report of Noy and Sklan (1999) and Saki (2005) that a decrease in body weight was observed in birds

which had no access to feed immediately compared to those fed the starter diet immediately after hatching.

Table1:Performance characteristics of effect of post-hatch feeding interval on hubbard broilers chicken(0-8weeks)

Parameters	T1	T2	T3	T4	T5	T6	T7	SEM	P-value
Initial weight (g)	47.20	46.03	46.63	45.77	46.06	45.94	45.74	0.21	0.53
Final weight (g)	1841.50^{b}	1808.75^{ab}	1901.33^{a}	1854.29^{ab}	1729.85^{bc}	1806.50^{ab}	1665.59^{c}	18.12	0.01
Daily Feed Intake (g)	77.86^{a}	64.69^{b}	66.43^{b}	65.58^{b}	64.15^{b}	65.38^{b}	65.56^{b}	0.54	0.02
Daily weight gain (g)	32.04^{ab}	31.48^{ab}	33.12^{a}	32.29^{ab}	30.07^{bc}	31.44^{ab}	28.93^{c}	0.32	0.01
Feed:Gain Ratio	2.54^{a}	2.10^{c}	2.05^{c}	2.05^{c}	2.17^{bc}	2.12^{bc}	2.34^{ab}	0.03	0.02
Feed cost/kg (₦)	269.82	269.82	269.82	269.82	269.82	269.82	269.82	0.00	1.00
Feed cost/kg/Wg (₦)	684.85^{a}	565.43^{c}	552.68^{c}	554.24^{c}	585.19^{bc}	571.25^{bc}	630.32^{ab}	8.15	0.02

^{abc} Means in the same row with different superscripts are significantly different (P<0.05), T1 – Feeding at hatchery at 8hours after hatching, T2 – Feeding at farm 10hours after hatching,T3 – Feeding 12hrs after hatching,T4 – Feeding 24hrs after hatching, T5 – Feeding 36hrs after hatching, T6 – Feeding 48hrs after hatching, T7 – Feeding 60hrs after hatching.

The result of the apparent nutrient digestibility (Table 2) shows that only nitrogen free extract was significantly ($p<0.05$)affected which contradicts the findings of Obun and Osaguna (2013) who reported that birds delayed access to feed at 12, 24 and 36h show better ($p<0.05$) digestibility co-efficients of dry matter, crude protein, crude fibre, ash and nitrogen free.

Table 2:Nutrient Digestibility of Hubbard Broiler Chicken on different post-hatch feeding intervals

Parameter (%)	T1	T2	T3	T4	T5	T6	T7	SEM	P-VALUE
Nitrogen Free Extract (%)	61.22^{a}	54.12^{ab}	58.48^{ab}	60.28^{a}	51.18^{b}	51.71^{b}	57.66^{ab}	1.13	0.04
Dry Matter (%)	87.70	85.44	88.00	85.91	90.52	87.62	85.10	0.74	0.52
Crude Protein (%)	79.15	81.74	82.07	77.66	88.47	81.44	78.07	1.34	0.41
Crude Fibre (%)	73.28	65.55	71.63	63.87	79.02	72.20	65.59	1.84	0.29
ASH (%)	58.64	40.21	55.64	52.37	63.27	61.68	45.00	3.01	0.34
Ether Extract (%)	86.92	84.27	87.68	86.32	89.55	87.86	85.67	0.80	0.75

^{ab} Means in the same row with different superscripts are significantly different (P<0.05)T1 – Feeding at hatchery at 8hours after hatching, T2 – Feeding at farm 10hours after hatching, T3 – Feeding 12hrs after hatching, T4 – Feeding 24hrs after hatching, T5 – Feeding 36hrs after hatching, T6 – Feeding 48hrs after hatching, T7 – Feeding 60hrs after hatching.

CONCLUSION AND RECOMMENDATION:

Post-hatch feeding intervals significantly affected the performance of Hubbard broiler birds and broiler chichens fed 12hrs after hatching performed better compare to other post hatch feeding periods

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