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Influence of Feed Trough Colour on the Performance of Starter and Finisher Broiler Chickens

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Abstract

A 56-day research exercise was conducted to discover which feed trough colour will induce higher feed intake in broiler starter and finisher for better performance. Usual feed-trough colour (galvanized with zinc) as control, red, white, yellow and green colours were used to coat the feed troughs deployed. Four hundred and fifty day old Zatech breed broilers of mixed sexes were divided into five groups and assigned to the five differently coloured feed troughs in a Completely Randomised Design of experiment (CRD). Each group was further divided into three replicates of thirty birds each. The parameters used for evaluation were: initial weight, final weight, weight gain, feed intake, feed conversion ratio, feed cost, cost of production of broiler, cost of chicken per kilogram, profit after sale and mortality. Statistical tool used on data collected was analysis of variance (ANOVA). Results at zero to two weeks of age post hatching indicated no significant difference among the groups in all parameters. Significant difference was observed in all parameters between the white group on white feed-trough and rest on the other coloured feed-troughs, at two weeks of age post hatching. It was therefore recommended that white coloured feed troughs be applied as feeders for broiler starter at two weeks to eight weeks of age for better performance and profit.

Keywords: Colour, broiler, feed-trough, starter, finisher

Introduction

Feed is a major input in animal and animal products' production. The ability to see in order to feed, drink and survive play major role in the survival of chicken for performance. Kuenzel (1983) divided the process of feed ingestion in birds into 5 stages – arousal and feed recognition, orientation, grasping, manipulation and swallowing. Adequate feed intake is necessary to enhance the gene potential for reproduction in number and in size (Allam, 1994). Peter and Eric (2013) worked on plate shape and colour interaction to influence taste. Deins (2016) worked on light colour preference in a cocktail system, while Neves *et al* investigated preference of broilers to certain feeders. Any development that will induce increased feed intake will be beneficial to the farmer.

It is in this regard that feeder colours were considered for investigation whether a particular colour in partitioned banquet system among the usual colours: galvanized with zinc, red, white, yellow and green would induce increased feed intake for enhanced meat quantity in broiler production.

Materials and Methods

The research was conducted at the Livestock Research Station of the Department of Animal Production and Health Technology, Imo State Polytechnic Umuagwo-Ohaji, Owerri, Nigeria. Four hundred and fifty Zatech broiler birds were procured from Pamalaw Livestock Enterprise, Owerri. The birds were divided into five groups of 90 birds each and assigned to the four differently, coloured feeding troughs in a completely randomized design of experiment. The colours employed were usual galvanized colour for control, red, white, yellow and green manufactured by Citizen Chemical Industries, Ltd Lagos, Nigeria. Each group was further divided into three replicates of thirty birds each. The birds were offered water, feed and warmth *ad libitum*. Necessary management practices were deployed when due. The parameters examined were average initial body weight, final body weight, body weight gain, feed intake, feed conversion ratio, feed cost, and cost of production, unit cost of chick, profit possibly made and mortality. The birds were weighed at the start of the investigation to obtain their initial weights and weekly afterwards. The trial was conducted for 56 days during the rains (June to August).

Data collections were subjected to analysis of variance (ANOVA) according to Snedecor and Cochran (1978). Where significant treatments effect was detected from the ANOVA, means were compared using Duncan's New Multiple Range Test (DNMRT) as outlined by Obi (1990).

Results and Discussion

Table 1 shows the performance of the broiler chicks (0-2 and 2-4 weeks old) and Table 2 is the performance of the broiler finisher birds (4-8 weeks). The average initial weights of the birds assigned to the different colours were 60.79; 60.97, 60.67, 60.86, and 60.83g for control, (galvanized zinc trough), red, white, yellow and green respectively. The body weight of all the groups at 2 weeks old were 250.86g for control, 251.36g for red, 255.61 g, and while, 250.96kg for yellow and 252.03g for

green. Similarly there was no significant ($p>0.05$) changes in body weight gain at 2 weeks post hatching:- control gained: 190.07g. Red: 190.39g white: 194.99g, yellow: 190.10g and green: 191.20 g No significant difference ($p>0.05$) was observed for feed intake. While the control consumed 520.21g, red group consumed 512.00g, white: 504.44g, yellow: 500.22g, the group in green consumed 516.31g. In feed conversion ratio 2.74, 2.69, 2.59, 2.63 and 2.70 were values for control, red, white yellow and green respectively. No significant ($p>0.05$) difference was detected. In feed cost, the sums spent only showed insignificant arithmetic differences. Fifty four naira ten kobo (₦54.10) was spent for control, red: ₦53.25, white: ₦52.46, yellow: ₦52.02 and ₦53.69 for green.

Cost of production of chicken showed no significant difference ($p>0.05$). The cost of production for control was ₦333.15; red, white, yellow and green cost ₦284.36, ₦273.82, ₦299.34 ₦295.38 respectively. Profit was not calculated at 2 weeks of age. No mortality was suffered at this stage too. Significant difference ($p<0.05$) was detected from second week to fourth week post hatching in all parameters applied for evaluation. The initial weights were 250.86, 251.36, 255.66, 250.96 and 252.23g for control, red, white, yellow and green respectively. The final body weight for control, red, white, yellow and green were 650.03, 653.41, 757.43, 598.19 and 655.24g respectively indicating significant ($p<0.05$) difference by the group in white feeding trough. Similarly while the group under the white feed-trough showed significant superiority in body weight gain (501.77g) the control gained 399.17g, red gained: 402.05g, yellow: 347.23g and green group gained 393.21g.

Table 1: Performance of the broiler starter chicks fed from differently coloured feed troughs (0-2 and 2- 4 weeks)

Parameters	Control		Red		White		Yellow		Green		SEM	
	0-2wks	2-4wks	0-2wks	2-4wks	0-2wks	2-4wks	0-2wks	2-4wks	0-2wks	2-4wks	0-2wks	2-4wks
Av-initial body wt (g)	60.79	250.86	60.97	251.36	60.67	255.66	60.86	250.96	60.83	252.23		
Av: Final body weight (g)	250.86	650.03 ^b	251.36	653.41 ^b	255.66	757.43 ^a	250.96	596.19 ^c	252.23	655.24 ^b	21.06	35.17
Av. Body weight gain (g)	190.07	399.17 ^b	190.39	402.05 ^b	194.99	501.77 ^a	190.10	347.23 ^c	191.20	393.21 ^b	8.77	19.04
AV. Feed intake (g)	520.21	780.11 ^b	512.00	768.00 ^b	504.44	825.72 ^a	500.22	750.53 ^a	516.31	774.02 ^a	6.15	14.21
Feed conversion ratio	2.74 ^b	1.95 ^b	2.69 ^b	1.91 ^b	2.59	1.65 ^a	2.63 ^c	2.16 ^b	2.70	1.94 ^b	0.11	0.32
Feed cost (₦/K)	54.19 ^b	81.00 ^b	53.25	79.87 ^c	52.46	81.87 ^a	52.02 ^c	78.05	53.69	80.50 ^b		
Cost of production (₦/K)	148.23	157.95 ^b	143.24	152.55 ^b	135.87	135.08	136.81	168.59	144.96	156.17 ^b		
Unit cost of Chicken	1200		1200		1200		1200		1200			
Profit (₦)		622.09		631.54		773.84 ^a	-	549.07 ^c		630.12 ^b		
Mortality	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Av: means average; g:gramme; N/K:Naira (Nigeria currency) per kilo gramme; abc – Means in the same row having different superscripts are significant by different ($P<0.05$)

Table 2: Performance of the broiler finisher chicken feed from differently coloured feed- troughs (4-8 weeks)

Parameters	Control	Red	White	Yellow	Green	SEM
Av-initial body weight (g)	650.03	653.41	757.43	598.19	655.24	
Av: Final body weight (g)	1670.08 ^b	1663.41 ^c	2013.04 ^a	2645.03 ^c	1682.48 ^b	24.66
Av. Body weight gain (g)	1020.05 ^c	1010.00 ^c	1255.61 ^a	1046.84 ^b	1027.24 ^c	16.41
Av. Feed intake (g)	1760.11 ^b	1775.52 ^b	1894.16 ^a	1744.47 ^c	1756.13 ^b	32.73
Feed conversion ratio	1.73 ^c	1.76 ^c	1.51 ^a	1.67 ^b	1.71 ^b	0.56
Feed cost (₦/K)	183.05	184.65 ^b	196.99	181.42 ^c	182.64	-
Cost of production (₦/K)	316.67 ^b	324.98 ^b	297.45 ^a	302.97 ^c	312.31 ^c	-
Unit cost of Chicken	1200	1200	1200	1200	1200	-
Profit (₦)	1687.33 ^c	1879.24 ^b	2118.19 ^a	1671.07 ^c	1706.67 ^b	-
Mortality	0.00	0.00	0.00	0.00	0.00	

abc – Means in the same row having different superscripts are significant ($p<0.05$)

Av: means average; g: gramme; N/K-Naira (Nigeria currency) per kilogram

Quantity of feed consumed by white group (825.72g) was significantly more ($p<0.05$) than 780.11, 768.00, 750.53 and 774.02g for control, red, yellow and green groups respectively. Invariably, as the white group consumed more feed, its feed cost was higher (₦81.87) against ₦81.00, ₦79.87, ₦78.05 and ₦80.50 for control, red, yellow and green groups respectively. In feed conversion ratio while the ratio for white was 1.65, those of control, red, yellow and green groups were 1.95, 1.91, 2.16 and 1.94 respectively. Birds in white group cost ₦135.08 to produce while those in control, red, yellow and green groups cost ₦157.95, ₦152.55, ₦168.59 and ₦156.17 respectively. In terms of profit possibly made, white registered higher profit (₦773.84) than the others ₦622.09, ₦631.54, ₦549.07 and ₦630.12 for control, red, yellow and green groups. No mortality was experienced during this period of investigation.

The initial body weight of the birds was control: 650.03g, red: 653.41g, white: 757.43g, yellow: 598.19 and green: 655.24g. The average final body weight were 1670.08, 1663.41, 2013.04, 1645.03 and 1682.48g for control, red, white yellow and green respectively. The birds in the white group showed superior difference ($p < 0.05$) over others. Similar observation was made in average body weight gain. While the control group gained 1020.05g and red. 1010.00g, the white groups gained 1255.61g. Others were yellow: 1046.84g and green to 1027.24g.

In feed intake, the white group showed significant difference ($p < 0.05$) (1894.16g) over control, red, yellow and green which consumed 1760.11, 1775.52, 1744.47 and 1756.13g of feed respectively. The ratio of feed conversion for the different groups was 1.73, 1.76, 1.51, 1.67, and 1.71 for control, red, white, yellow and green. There was significant difference as shown by birds in white feeding troughs. Feed costs were control ₦183.05, red: ₦184.65, white: ₦196.99, yellow; ₦181.42 and green: ₦182.64. The cost of feed consumed by the group feeding from white troughs was higher than the rest of the groups. The reason was that the white group consumed higher quality of feed than the rest. Surprisingly, the cost of production of the white group was lower (₦297.45) when compared with the rest – ₦316.67, ₦324.98, 302.97 and ₦312.31 for control, red, yellow and green respectively. The prevailing average price of a kilogram of chicken meat was ₦1200.00. This was used to multiply average final body weight. The result was divided by 1000 to bring the value from gramme to kilogram. This gave the sale sum. When the cost of production was subtracted, from the sale sum, the product was the profit possibly made. No mortality was suffered.

Conclusion

The research revealed that no significant observations were made at a 2 weeks post hatching on the parameters investigated because the birds could not differentiate colours of the feed-troughs at that age. After 2 weeks post-hatching, the birds could separate colours and were so influenced in feed intake. This was evident by their performances at 2-4 weeks post hatching. The white coloured feed-trough significantly influenced feed intake and so the birds under it significantly excelled in all parameters from two (2) weeks post hatching and onwards. It was therefore recommended that white coloured feed trough be used for increased feed intake and enhanced performance.

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