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THE PERFORMANCE OF BROILER CHICKENS FED WET AND AIR-DRY MASH IN HUMID TROPICAL ENVIRONMENT

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ABSTRACT

The performance of broiler chickens fed mash of four levels of wetness was compared with the performance of birds fed air-dry mash during the hot-dry and cool-dry seasons. To each 2.5kg air-dry mash, was added 500,750, 1,000 and 1,250 mls of clean water to constitute the wet mash feed treatments, which were designated slightly wet, moderately wet, highly wet and extremely wet respectively. The air-dry mash served as the control. Two sets of experiments comprising 350 and 600 broiler chickens were carried out in the hot-dry and cool-dry seasons respectively. The birds were divided into treatment groups according to levels of wetness of feed. During the hot-dry seasons, extremely wet mash significantly ($P<0.05$) improved the final body weight of broiler chickens. Final body weight reduced as level of wetness decreased. However, during the cool-dry season, no significant difference ($P>0.05$) was observed. Final body weight for birds on the AD, SW, MW, HW and EW rations were respectively 1300.43g, 1352.71g, 1366.29g, 1404.71g and 1430.14g for the hot-dry season and 1677.50g, 1648.42g, 1665.08g, 1632.92g and 1619.83g for the cool-dry season. Results of feed intake during the hot-dry season were 54.65g, 55.72g, 60.07g, 57.49g and 60.95g while that for cool-dry season were 78.30g, 79.32g, 81.91g, 81.32g and 83.37g for birds on AD, SW, MW, HW and EW rations respectively. However, using a t-test, significant differences ($P<0.05$) were observed in the following parameters: final livebody weight, weight gain and feed intake but no significant difference ($P>0.05$) was observed in the EFU between the two seasons. Feeding of wet mash was not of any particular benefit to broiler chickens in the cool-dry season since the prevailing temperature was moderate enough to allow normal feeding activities. However, wet mash feeding, particularly, extremely wet mash had some advantage during the hot-dry season in the final body weight dynamics.

KEY WORDS: Performance of broiler chickens, air-dry mash, wet mash, cool-dry and hot-dry seasons.

INTRODUCTION

One of the problems facing broiler production in the hot humid tropics is the high ambient temperature, which imposes heat stress on the birds resulting in low feed intake (Oluyemi and Roberts, 1979; Oluyemi and Adebanjo, 1979). The consequence of this is low body weight. Several researchers have made efforts to overcome this problem. Such efforts include: night – feeding under illumination (Laseinde and Igbasan, 1994), stocking density (Offiong, et.al, 1979) and modified housing designs (Oluyemi and Roberts, 1979). Limited studies have however, been carried out in the feeding of wet mash as a way of overcoming the effect of high ambient temperature aimed at promoting performance of broiler chickens (Monsi, et.al; 1983 and 1992; Abasiekong, 1988 and 1989).

The present study was carried out to evaluate the performance of broiler chickens fed mash of four levels of wetness under conditions of high and moderate ambient temperatures.

MATERIALS AND METHODS

Two experiments were carried out in the Teaching and Research farm of the University of Uyo during the hot-dry and cool-dry seasons using mash of different levels of wetness.

TRIAL I

The first experiment was carried out in the hot-dry months of February to March using 350 Anak strain commercial broiler chickens of mixed sexes which had been conventionally raised to four weeks of age before being placed on the experiment. They were then divided into ten groups of 35 birds each with a mean initial body weight of 237.99g. Two groups were then assigned at random to each of 5 treatments. Data were collected weekly on body weight,

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weight gain, feed intake and efficiency of feed utilization. The experiment lasted for seven weeks. Rearing was done in a tropical type deep litter half-walled pen, with wire netting at the top. The birds were reared under natural day-light without night illumination.

TRIAL 2

The second experiment was undertaken during the cool-dry months of November to January. Six hundred Anak broiler chickens of mixed sexes which had been conventionally raised for four weeks before being placed on the experiment were used in the study. The birds were weighed and divided into fifteen groups of 40 birds each with a mean initial body weight of 381.24g. Three such groups were then assigned at random to each of 5 treatments. Rearing conditions and management procedures were as outlined in trial 1.

FEED AND FEEDING

The wet diets were prepared by adding 500,750, 1,000 and 1,250 mls of clean water to each 2.5kg of air-dry commercial finisher mash and thoroughly mixed manually to a uniform consistency. These constituted slightly wet (SW), moderately wet (MW), highly wet (HW) and extremely wet (EW) experimental diets respectively while the air-dry (AD) mash served as control. The composition of the air-dry mash as indicated on the feed label is shown on Table 1. As a precaution against spoilage, the wet mash feeds were prepared and supplied at 6 hourly intervals. Feed and water were supplied ad. libitum. Left-over feeds were oven dried to a constant weight to determine the actual amount of dry mash consumed on air-dry basis and then discarded.

STATISTICAL ANALYSIS

Data collected from the 2 trials were subjected to Analysis of variance procedure of Snedecor and Cochran (1980). Duncan's multiple Range Test procedure (Duncan1955) was used to measure significant difference in the treatment means at 5% level. A t-test was used to analyse differences between the means of the parameters studied for the two seasons (Snedecor and Cochran, 1980).

RESULTS AND DISCUSSION

Results of the two experiments are presented on tables 2 and 3. Final body weight performance improved significantly ($P<0.05$) in trial 1 when wet mash was fed to broiler chickens (Table 2), in the hot-dry season. This agrees with earlier findings by Abasiekong (1989) who observed improvement with the feeding of wet mash in the hot-dry season. The final body weight, improved as level of feed wetness increased.

Table 1: Composition of the AD mash used in the experiment

INGREDIENT	COMPOSITION (%)
Metabolisable energy	2850 kcal/kg
Crude protein	19.00
Crude fat	5.00
Crude fibre	5.00
Crude ash	6.40
Calcium	1.10
Phosphorus	0.60
Available Phosphorus	0.40
Lysine	0.90
Methionine	0.45
Methionine + Cystine	0.80
Vitamin A	12,500 i.u.
Vitamin D_3	3,000 i.u.
Vitamin E	30mg
Vitamin B_2	5mg
Vitamin C	150mg
Manganese	70 mg
Sodium	0.16 mg
Zinc	50mg

Feed label, Guinea Feeds: EWU, Nigeria

Table 2: Effects of feeding Air-dry and wet mash on the performance of broiler chickens during the hot-dry season.

	PARAMETERS				
Dietary Treatments (Mash Types)	Initial body weight (g/bird)	Final live body weight (g/bird)	Daily feed Intake (g/bird)	Daily Body Weight gain (g/bird)	**Efficiency of feed utilisation**
AD	239.29	1300.43 ± 21.52^{d}	54.65±6.31	21.65±3.71	**2.52±0.36**
SW	236.43	1352.71 ± 15.78^{c}	55.72±6.05	22.78±3.95	**2.45±0.38**
MW	243.71	1366.29 ± 12.56^{bc}	60.07±7.30	22.91±3.73	**2.62±0.44**
HW	234.29	1404.71 ± 7.66^{ab}	57.49±7.65	23.70± 3.19	**2.42±0.32**
EW	237.14	1430.14 ± 11.73^{a}	60.95±8.80	24.35±2.96	**2.50±0.29**
Statistical Significance	N.S	*	N.S	N.S	N.S

Values are means ± S.E.
N.S. = Not Significant
* = Significant ($P<0.05$) ^{abc} means within the same column with different Superscripts are significantly different ($P<0.05$).

Table 3: Effects of feeding Air-dry and wet mash on the performance of broiler chickens during the cool-dry season.

	PARAMETERS				
Dietary Treatments (Mash Types)	Initial body weight (g/bird)	Final live body weight (g/bird)	Daily feed Intake (g/bird)	Daily Body Weight gain (g/bird)	**Efficiency of feed utilisation**
AD	381.25	1677.50±21.18	78.30±7.06	37.04±1.31	**2.11±0.15**
SW	381.21	1648.42±22.49	79.32±7.48	36.21±0.89	**2.20±0.21**
MW	381.29	1665.08±14.92	81.91±9.34	36.21±1.99	**2.23. ±0.21**
HW	381.25	1632.92±20.99	81.32±8.34	35.76±1.75	**2.27±0.16**
EW	381.21	1619.83±17.02	83.37±8.45	3 38±0.37	**2.36±0.24**
Statistical Significance	N.S	N.S	N.S	N.S	N.S

Values are means ± S. E.

N.S. = Not Significant ($P>0.05$)

While birds on the EW mash had the highest finishing weight, those on the AD mash had the least weight. Accordingly, broiler chickens fed EW mash made 129.71g improvement over and above those on the AD mash. Those on the HW mash made 104.29g improvement while those on the MW and SW mashes made 65.86 and 52.29g improvement respectively over those on the AD mash. This improvement could be due to heat stress relief on the birds placed on wet mash treatment, which appeared to facilitate normal feeding activities.

In trial 2, no significant difference ($P>0.05$) was observed in body weight performance among the treatments (Table 3). This period was the cool-dry season with the general lowering of ambient temperature which appeared to encourage feeding. Results of body weight gain, feed intake and efficiency of feed utilisation however did not indicate any significant difference ($P>0.05$) among the treatments during both seasons.

This non significant difference was consistent with observation of Monsi, et. al., (1992) who did not observe performance differences among birds fed wet and dry mashes using the same parameters.

However, a t-test analysis of differences between the means of the parameters studied for the two seasons showed that final livebody weight, weight gain and feed intake were significantly different ($P<0.05$). For efficiency of feed utilisation, no significant difference ($P>0.05$) was however observed between the two seasons. This indicates that feeding wet mash to broiler chickens during the hot-dry season improved the feed utilisation to the level of air dry mash fed during the cool-dry season.

CONCLUSION:

Since every gramme of body weight gain is important to commercial broiler chicken producers, feeding boiler chickens with EW mash in the hot-dry season may be beneficial as it encourages feeding activities at this time, while the use of AD feed would be of immense advantage in the cool-dry season.

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