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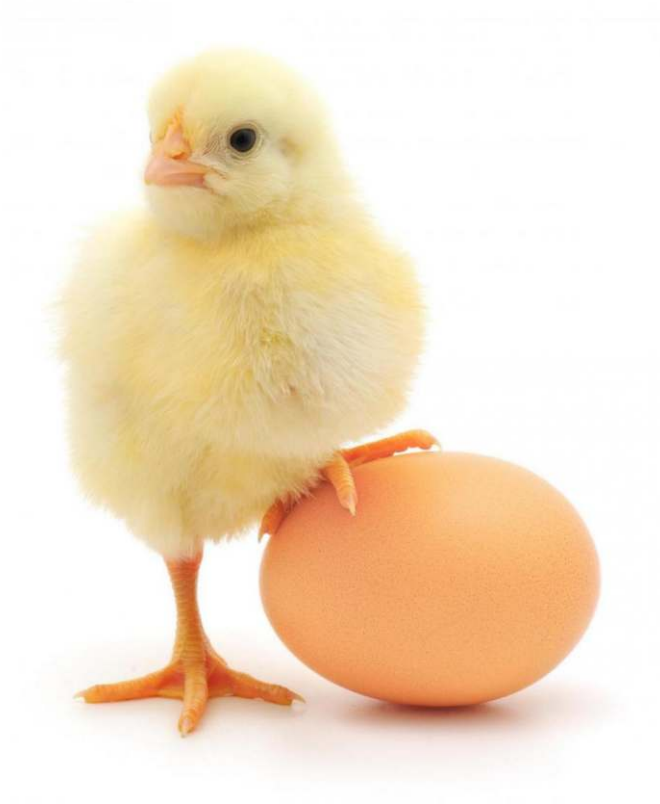

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Performance of Muscovy Ducks under Three Management Systems in South Eastern Nigeria

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Abstract: A study was conducted to evaluate the performance of Nigerian native muscovy ducks in terms of growth and feed utilization in a Randomized Complete Block Design (RCBD) under semi intensive system (SI), Intensive system with wallow (IW), and intensive system without wallow (IO). Eighteen males and equal number of female ducklings were allotted to two replicates each of the three treatments and fed from week 5 to week 20 with diet containing 17% CP and 2848.9 kcal/kg energy. Weekly weights were measured and compared using two-way analysis of variance. Final body weights were SI (males: 2507.07g, females: 1733.83g), IW (males: 2466.67g, females: 1641.17g) and IO (males: 2464.84g, females: 1657.67g). Average daily gains of drakes were 16.07g (SI), 16.39g (IW) 15.87g (IO); while those of females were 10.18g, 11.03g and 9.91g respectively. Average daily gain of drakes was significantly higher ($P<0.05$) than that of females (16.11g versus 10.17g). Average feed intake were 128.54g, 130.68g and 131.14g daily in the respective groups while feed conversion ratios were 11.56, 11.44, and 12.16 respectively too. Management systems adopted in this trial did not have significant effect ($P>0.05$) on performance of muscovy ducks in the region.

Key words: Muscovy ducks, wallowing, daily gain, management systems

Introduction

Ducks naturally like watering and obtaining their feed from both land and water. Their webbed feet suggest that water could be their habitat too. In South Eastern Nigeria, most farmers were found keeping muscovy ducks on extensive system and less in intensive sheds (Etuk and Abasiekong, 2005). Ola (2000) also noted that over 90% of indigenous Nigerian muscovy ducks are reared under extensive system with little or no feed supplementation. Hence, growth rate was not encouraging compared to other research reports where improved management systems were used (Men *et al.*, 2000; Dong and Ogle, 2000).

Mtui and Mbaga (2001) reported better performance by muscovy ducks reared under improved management systems in Tanzania. This trial was designed to evaluate the performance of this indigenous Nigerian muscovy ducks reared under three management systems, as well as the effect of water supply as wallow for ducks.

Materials and Methods

Study site: This experiment was carried out at the college farm of Akwa Ibom State College of Agriculture, Teaching and Research Farm, Obio Akpa, Nigeria. This Poultry unit is situated near a stream so as to enable ducks raised on semi-intensive management system had access to the stream. Climatic data at the College meteorological station indicated annual rainfall which ranged between 1770mm and 2400mm; relative humidity of between 55% and 86%; and temperature ranged of 18°C - 27°C on minimum and 24°C - 36°C on maximum.

Birds, treatment and experimental design: Randomized Complete Block Design (RCBD) was used for the experiment. There were three treatments (semi intensive (SI), intensive with wallow (IW), and intensive without wallow (IO), and each treatment was sub-divided into 2 replicates. Four weeks old ducklings were used for the trial. Three male and 3 female muscovy were allotted to each replicate giving a total of 18 males and 18 females. Ducks were reared to 20 weeks of age and body weights were measured on weekly basis. Ducks were fed diet containing 17% CP and 2848.9 Kcal/kg energy (Table 1). Feeding was *ad libitum* under intensive systems; but ducks under semi intensive system were fed with the compounded feed twice daily (morning and evening)and were allowed to scavenge between 08:00 hour and 17:00 hours in addition. Feed intake was also measured, from which feed utilization was computed.

Data analysis: Data obtained were analyzed using two-way analysis of variance according to Steel and Torrie (1980); while means differing significantly were separated using Least Significant Difference (LSD) as described by Snedecor and Cochran (1996).

Results and Discussion

The results of growth parameters of drakes are presented in Table 2. There was no significant

Table 1: Composition of Experimental Diet

Ingredients	Composition kg/ton
Maize	300
Soya beans	120
Wheat offals	143
Palm kernel cake	110
Brewers dried grain	190
Fish-meal	90
Oyster shell	28
Bone meal	12.3
Salt	2.5
DL-methionine	0.8
Lysine	0.9
Total	1000.00
Vitamin/Mineral Premix*	2.5
Chemical Composition (% of DM)	
Crude Protein	17.00
Crud Fibre	3.81
Ether Extract	8.60
Calcium	0.64
Phosphorus	0.70
ME Kcal/kg	2848.90
Dry Matter (%)	84.81

* Each 2.5 kg contains:Vit. A, 10,000,000 IU; Vit. D3, 2,000,000 IU; Vit. E, 20,000 IU; Vit. K, 2,000 mg; Thiamine (B1), 2,400 mg; Ribfolavin (B2), 4,800 mg; Pyridoxine (B6) 4,800 mg; Niacin, 32,000 mg; Vit. B12, 20 mg; Pantothenic Acid, 8,000 mg; Folic Acid, 800 mg; Biotin 64 mg; Choline chloride, 600 mg; Antioxidant, 125 g; Manganese, 100 g; Zinc, 40 g; Iron, 36 g; Copper, 4 g; Iodine, 1.2 g; Selenium, 200 mg; Cobalt, 200 mg

Table 2: Average Daily Gains (g) of Drakes Under Three Management Systems (week 5-20)

Week	SI	IW	IO
5	17.83±1.95	17.60±0.07	19.60±0.78
6	17.38^{C}±0.26	24.88^{a}±0.54	21.43^{b}±0.57
7	21.38^{a}±0.40	18.95^{b}±0.32	20.24^{ab}±0.77
8	15.21±0.61	15.74±0.61	16.41±0.38
9	23.57^{b}±0.31	23.12^{b}±0.34	24.55^{a}± 0.38
10	26.45±0.47	26.83±0.51	26.05±0.44
11	21.12±2.74	23.74±0.38	19.72±2.08
12	11.36±1.41	11.64±0.50	12.74±1.24
13	10.38±1.57	8.29±0.64	8.15±0.34
14	8.72^{b}±0.58	10.14^{a}±0.56	7.86^{b}±0.53
15	15.10±0.74	16.69±0.86	14.05±0.92
16	16.98±2.46	12.67±0.57	13.12±1.00
17	12.14±0.46	11.24±1.00	11.83±0.71
18	10.64±0.75	11.76±0.67	9.95±0.38
19	12.83±0.54	12.62±1.66	12.38±1.82
Total	241.09	245.91	238.08
Mean	16.07±1.36	16.39±1.53	15.87±1.49

[abc]Treatment means with similar superscripts along the same row are not significantly different (P>0.05)

Table 3: Average Daily Gain (g) of Ducks under Three Management Systems (week 5-20)

Week	SI	IW	IO
5	20.74±1.90	16.60±0.07	20.83±0.74
6	12.81^{C}±1.14	24.88^{a}±0.54	16.57^{b}±0.39
7	18.80±0.39	18.95±0.32	15.17±0.38
8	9.29±0.71	15.74±0.61	8.31±0.50
9	5.40±0.57	4.74±0.73	5.12± 0.86
10	7.53±0.46	7.95±0.32	7.22±0.55
11	11.53±3.03	5.40±0.84	10.00±2.73
12	9.76±1.84	10.11±2.19	8.12±2.39
13	3.98^{b}±0.65	7.00^{a}±0.42	4.69^{b}±1.03
14	6.24±1.23	7.83±1.30	7.17±0.98
15	7.41±0.76	5.76±0.74	6.38±0.86
16	8.64±0.78	10.57±0.51	8.48±11.16
17	9.50±1.37	9.64±0.57	8.57±0.75
18	8.98±1.40	9.29±0.58	10.64±0.53
19	12.28±0.79	10.95±0.58	11.33±0.88
Total	152.69	165.41	148.60
Mean	10.18±1.18	11.03±1.46	9.91±1.16

[abc] Treatment means with similar superscripts along the same row are not significantly different (P>0.05). Final body weights of drakes in this trial were 2507.07g (SI), 2466.67g (IW), 2464.83g (IO); while those of ducks were 1733.83g, 1641.17g and 1657.67g respectively.

Table 4: Sexual Dimorphism in Growth Performance of Muscovy Ducks

Week	Male (g)	Female (g)	Percentage difference
5	18.34±0.63	19.25+1.53	-4.9
6	21.23^{a}±2.17	17.10^{b}±2.65	19.45
7.	21.19^{a}±0.70	17.62^{b}±1.24	12.73
8	15.79^{a}±0.35	9.10^{b}±0.42	42.37
9	23.75^{a}±0.42	5.09^{b}±0.19	78.57
10	26.44^{a}±0.23	7.57^{b}±0.21	71.37
11	21.53^{a}±1.18	8.98^{b}±1.84	58.29
12	11.91±0.42	9.33±0.61	21.66
13	8.94^{a}±0.72	5.22^{b}±0.91	41.61
14	8.91^{a}±0.67	7.08^{b}±0.46	20.54
15	15.28^{a}±0.77	6.52^{b}±0.48	57.33
16	14.26^{a}±1.37	9.23^{b}0.67	35.27
17	11.74^{a}±0.26	9.24^{b}±0.34	21.30
18	10.78±0.53	9.64±0.51	10.58
19	12.61±0.13	11.52±0.40	8.64
Total	241.70	152.49	
Mean	16.11^{a}±1.43	10.17^{b}±1.14	36.87

[ab] Treatment means with different superscripts along the same row are significantly different (P<0.05)

difference (P>0.05) between SI, IW and IO during weeks 5, 8, 10 - 13, and 15-19 in terms of average daily gains; but treatment means differed significantly (P<0.05) during weeks 6,7,9 and 14 of the trial. Highest average daily gains were 26.45g (SI), 26.83g (IW) and 26.05g (IO), while lowest values were 8.72g, 8.29g and 7.86g respectively in male muscovy. Overall average daily gains of drakes were thus 16.07g under semi intensive system, 16.39g under intensive system with wallow and 15.87g under intensive system without wallow. There was, however, no significant difference (P>0.05) between growth performances of drakes due to management system. Similarly, results of growth performance of female muscovy showed no significant treatment effect (P>0.05) in overall performance during the period as average daily gains of ducks in SI was 10.18g, 11.03g under intensive system with wallow and 9.91g under intensive without wallow (Table 3). Average growth rate in this experiment were lower than 25g reported by Ngapongora *et al.* (2004) in Tanzania. According to these authors, drakes grew within the

same period to reach 2868g while ducks grew to average of 1821g.

Meulen *at al*. (1999) stated that muscovy ducks does not grow very quickly, and its final weight depends on the way it is kept and fed. The variability in growth rate and body weight between males and females of this species is described as sexual dimorphism and was noticed by previous researchers (Nwachukwu, 1998, Ola, 2000). Hence, there was significant difference ($P<0.05$) in average daily gains of males (16.11g) and females (10.17g), which shows about 37% increase in body weight gain of males over females in this experiment (Table 4).

Feed intakes in the three treatments were 128.54g (SI), 130.68g (IW) and 131.14g (IO) while feed conversion ratios were 11.56, 11.44 and 12.16 respectively. There was no significant difference ($P>0.05$) between these values attributable to treatment.

Conclusion and Recommendation: Management systems adopted in this trial did not affect final body weight, growth rate, feed intake and feed conversion ratio of muscovy ducks raised to twenty weeks of age. However, muscovy drakes gained more weight daily and attained greater body weight at slaughter than females. Moreover, wallowing did not confer additional advantage on muscovy ducks performance in terms of growth and feed utilization.

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