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## Comparative Study on Some Productive Traits of Muscovy and Sudani Ducks in Egypt

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**Abstract:** To evaluate the productive performance of Sudani ducks (local breed) in comparison with Muscovy ducks (imported breed) this experiment was conducted during summer season in Egypt. A total number of 24 Sudani (*Cairina moschata*) and 24 Muscovy (*Cairina moschata*) ducklings (3 weeks old) were used in this study, to evaluate some productive traits including growth performance and carcass characteristics. The results revealed that body weight gain of Muscovy breed was significantly higher by 27.22% than Sudani breed at 3-12 weeks of age. Meanwhile, Muscovy ducklings consumed more feed at 3-12 weeks of age than Sudani breed. Feed conversion was better in Muscovy (4.37) than Sudani (5.25) ducks. The results also indicated that percentage of inedible parts and dressing and deboning percentage were approximately similar in both breeds. Percentage of giblets in Sudani ducks was significantly higher than in Muscovy, while percentage of carcass fat, breast and drumsticks were significantly higher in Muscovy compared to Sudani ducks. Moisture percentage was higher ( $p < 0.05$ ) while ether extract and ash percentages were lower ( $p < 0.05$ ) in breast and leg meat of Muscovy ducks as compared to Sudani ducks. Protein percentage in breast and leg meat was similar in the two breeds. It is concluded that Muscovy ducks had better productive performance than Sudani ducks. Moreover, Muscovy ducks had higher percentages of carcass fat, breast and drumsticks than Sudani ducks. Meat of Sudani ducks is characterized by its lower percentage of moisture with higher percentages of ether extract and ash than meat of Muscovy ducks.

**Key words:** Muscovy duck, Sudani duck, performance

### INTRODUCTION

In the recent years, the role of poultry in meat production, had received a great attention. Ducks are considered the second common strains of poultry in the world. In Egypt, more attention is focused lately on increasing meat production, particularly ducks which are considered the easiest domestic poultry (El-Soukkary *et al.*, 2005).

Sudani breed is considered a local breed and more favorable to the Egyptian consumer and more heat tolerant as compared to Muscovy duck (foreign breed). Muscovy breed was reported in the literature to be superior to Sudani breed in the productive and reproductive traits.

Body weight of the African Muscovy duck (12-week old) male weighed 1832 g, while the female reached only 68.2% of the male weight (Tiguia *et al.*, 2008). Banga-Mboko *et al.* (2007) found that the native Muscovy ducks in Congo Brazzaville, with closed housing, commercial feeding and veterinary care. The maximum daily weight gain in males reached 55 g/day, whereas in females reached 35 g/day. The carcass yield was 70% and 51% in males and females, respectively. Body weight of the Muscovy ducks in Egypt (7 week old) male weighed 2404 g with feed conversion recorded 2.5. While body weight of the sudani duck (one year old) weighed 2171 with feed conversion recorded 4.4 (Abd El-Samee, 1982). Further studies were reported on

Muscovy ducks in Egypt (Fattouh, 1994; El-Kaiaty *et al.*, 2001; 2004; El-Ghamry *et al.*, 2004; Mosaad *et al.*, 2009; Ghonim *et al.*, 2009; Hassan, 2011). Meanwhile, little information is available on Sudani duck (Kamar, 1962; Farghaly and Asar, 1988; Osman *et al.*, 2003; Ali, 2005). The present study aimed to compare between Sudani and Muscovy ducklings in growth performance and carcass characteristics during summer season in Egypt.

### MATERIALS AND METHODS

This study was carried out at Nubareia Research Station belonging to National Research Center, Egypt. This experiment extended from 15 June to 31 August and average ambient temperature during this period was 32°C.

A total of forty eight unsexed ducklings of 3 weeks of age (24 Muscovy and 24 Sudani) were used in this study. Ducklings were brooded in floor pens with deep wheat straw litter. All the experimental ducklings were fed ad libitum a corn-soybean meal diet containing 18.28% CP and 2922 kcal ME/kg (grower diet) according to the requirements of Muscovy ducks. Feed ingredients and chemical composition of grower diet are shown in Table 1. Daily routine management was provided to all birds including free access to drinking water. Lighting was 23 hours light and one hour dark.

Table 1: Feed ingredients and chemical composition of grower diet from 3 to 12 weeks d of age

Ingredients (%)	Grower diet
Yellow com	65.75
Rice bran	6.00
Soybean meal	17.50
Yellow gluten	6.75
Dicalcium phosphate	1.50
Limestone	1.40
Vitamin and mineral premix*	0.30
DL-Methionine	0.15
L-lysine	0.05
Sodium chloride	0.30
Anti aflatoxin	0.30
<b>Calculated composition</b>	
Metabolizable energy, kcal/kg	2922.00
Crude protein %	18.281
Calcium, %	0.904
Available phosphorus, %	0.391
Methionine, %	0.798
Lysine, %	0.530

\*Supplied the following per kilogram of diet: Vitamin A 12,000 IU; vitamin D<sub>3</sub> 2,000 IU; vitamin E 10mg; vitamin K 2mg; vitamin B<sub>1</sub> 1mg; vitamin B<sub>2</sub> 4mg; vitamin B<sub>6</sub> 1.5mg; vitamin B<sub>12</sub> 10mcg; Biotin 50mcg; Niacin 20mg; pantothenic acid 10mg; Folic acid 1mg; selenium 0.1mg; Choline Chloride 500mg; Copper 10mg; Iodine 1mg; Iron 30mg; Manganese 55mg and Zinc 50mg

Live body weight for each bird was recorded every 3 weeks and body weight gain was calculated. Feed consumption was recorded also every three weeks and feed conversion was calculated.

At the end of experiment, 4 birds (2 males and 2 females) from each breed were randomly chosen and individually weighed, fasted for 12 hours, then slaughtered, manually feathered and eviscerated. The internal organs were carefully separated. Blood weight was calculated as the difference between live body weight and the slaughter weight after complete bleeding. Feather weight was calculated as the difference between slaughter weight after complete bleeding and the weight after removal of the feather. Inedible parts (blood + feather + alimentary canal), giblets (gizzard +

liver + heart), eviscerated carcass and carcass fat were weighed and percentages were calculated relative to live body weight. Deboning, neck, back, wings, breast, thigh, drumsticks and Loss of cut were weighed and percentages were calculated relative to carcass weight. All meat muscle of breast and leg from one side of each carcass was excised and hashed, then meat samples were taken and chemically analyzed for moisture, crude protein, ether extract and ash according to AOAC methods (1995).

All parameters were statistically analyzed using T test.

**RESULTS AND DISCUSSION**

**Growth performance:** Mean body weight and body weight gain (g/bird) for Muscovy and Sudani ducks from 3 up to 12 weeks of age are shown in Table 2. Body weights in the two breeds at 3 weeks of age were almost similar, while body weight and body weight gain were significantly (p<0.05) higher in Muscovy than in Sudani ducks. Present results indicated that body weight gain was increased by 27.22% in Muscovy compared to Sudani ducks. Meanwhile, feed intake of Muscovy ducks during the same period (3-12 weeks of age) was higher than that of Sudani breed by 6.0% and feed conversion was better in Muscovy than Sudani ducks, being 4.37 and 5.25 respectively (Table 3). Ali (2005) showed that body weight of Muscovy ducks was significantly heavier up to 20 weeks of age than Sudani ducks and Muscovy birds consumed 3.7% more feed during the first 12 weeks of age compared to Sudani ones. Ali (2005) also reported that feed conversion of Muscovy ducks was significantly better than Sudani ducks, being 3.29 and 4.41 respectively. These results are in consistent with the present results but with different values. Average body weight at 12 weeks of age in the present study was 2590.0 g for Muscovy and 2213.7 g for Sudani ducks. Heavier body weight (3243.3 g) for Muscovy at similar age was obtained by El-Badry (2004) and lower body weight (2017.0 g) for Sudani at the same age was obtained by Farghaly and Asar (1988).

Table 2: Means (±SE) of live body weight and body weight gain for Muscovy and Sudani ducks fed on grower diet

Breed	Live body weight g/bird				Body weight gain g/bird			
	(Age)							
	3wk	6wk	9wk	12wk	3-6wk	6-9wk	9-12wk	3-12wk
Muscovy	701.67 ±26.92	1583.33 <sup>a</sup> ±71.39	2060.00 <sup>a</sup> ±83.03	2590.00 <sup>a</sup> ±106.34	881.67 <sup>a</sup> ±51.39	476.67 <sup>a</sup> ±25.21	530.00 <sup>a</sup> ±47.55	1888.33 <sup>a</sup> ±84.69
Sudani	729.17 ±36.94	1419.79 <sup>b</sup> ±56.30	1785.63 <sup>b</sup> ±51.64	2213.75 <sup>b</sup> ±044.34	690.63 <sup>b</sup> ±31.42	365.84 <sup>b</sup> ±28.66	428.12 <sup>b</sup> ±56.98	1484.58 <sup>b</sup> ±47.35

<sup>a,b</sup> in each column means superscripted with different letters differ significantly (p<0.05)

Table 3: Means of feed intake and feed conversion of Muscovy and Sudani ducks fed on grower diet

Breed	Feed intake g/bird/day				Feed conversion			
	(Age)							
	3-6wk	6-9wk	9-12wk	3-12wk	3-6wk	6-9wk	9-12wk	3-12wk
Muscovy	117.46	123.47	152.21	131.05	2.80	5.44	6.03	4.37
Sudani	114.85	110.12	146.05	123.67	3.49	6.32	7.16	5.25

Table 4: Means (±SE) of carcass characteristics for Muscovy and Sudani ducks fed on grower diet

Breed	LBW <sup>a</sup>	Inedible parts		Giblets		Eviscerated carcass		Carcass fat		Deboning	
		g	%	g	%	g	%	g	%	g	%
Muscovy	2440±263.19	548±7.40	22.28±0.975	103.75±2.59	4.37±0.368	1788.25±190.34	73.35±0.803	99.50±7.73	5.63±0.34	1526.75±161.43	85.39±0.14
Sudani	1800±100.00	395±5.21	22.14±1.170	86.75±6.57	4.80±0.140	1318.25±090.12	73.06±1.070	30.75±5.02	2.29±0.27	1133.50±080.96	85.92±0.35

<sup>a,b</sup> in each column means superscripted with different letters differ significantly (p< 0.05). LBW: Live Body Weight.

Table 5: Means (±SE) of carcass cuts weights for Muscovy and Sudani ducks fed on grower diet

Breed	Carcass	Neck		Back		Wings		Breast		Thigh		Drumsticks		Loss of cut	
		g	%	g	%	g	%	g	%	g	%	g	%	g	%
Muscovy	1788.25 <sup>a</sup>	102.50	5.80 <sup>b</sup>	391.75	21.91 <sup>b</sup>	167.50	9.45 <sup>b</sup>	645.25 <sup>a</sup>	35.9 <sup>a</sup>	152.75	8.56 <sup>b</sup>	319.75 <sup>a</sup>	17.89 <sup>a</sup>	8.75	0.498
	±190.34	±6.98	±0.21	±41.14	±0.32	±15.08	±0.50	±79.49	±0.60	±16.06	±0.15	±34.43	±0.27	±0.480	±0.028
Sudani	1318.25 <sup>b</sup>	120.50	9.12 <sup>a</sup>	314.50	23.86 <sup>a</sup>	170.00	12.92 <sup>b</sup>	403.00 <sup>b</sup>	30.56 <sup>b</sup>	121.25	9.22 <sup>a</sup>	181.50 <sup>b</sup>	13.77 <sup>b</sup>	7.50	0.557
	±80.12	±9.87	±0.26	±21.61	±0.18	±11.11	±0.33	±28.36	±0.088	±7.36	±0.18	±13.00	±0.23	±1.44	±0.083

<sup>a,b</sup> in each column means superscripted with different letters differ significantly (p<0.05)

Table 6: Means (±SE) of chemical composition of breast and leg for Muscovy and Sudani ducks fed on growing diet

Breed	Breast				Leg			
	Moisture (%)	Protein (%)	Ether extract (%)	Ash (%)	Moisture (%)	Protein (%)	Ether extract (%)	Ash (%)
Muscovy	74.04±0.585	19.92±0.377	4.761±0.535	1.276±0.346	73.07±0.621	19.32±0.466	5.856±0.520	1.752±0.300
Sudani	71.53±0.587	19.74±0.499	6.404±0.373	2.328±0.174	70.80±0.339	19.40±0.417	7.278±0.290	2.520±0.323

<sup>a,b</sup> in each column means superscripted with different letters differ significantly (p<0.05)

**Carcass characteristics:** Carcass characteristics are presented in Table 4 for Muscovy and Sudani ducks. Current results clearly showed that absolute weights of eviscerated carcass, were significantly ( $p<0.05$ ) higher in Muscovy than in Sudani ducks. Ali (2005) and El-Soukkary *et al.* (2005) found that Muscovy duck had a significant higher carcass yield than that of Sudani ducks.

However, percentages of inedible parts, dressing and deboning were almost the same in the two breeds. These results indicated that variation in the inedible and carcass absolute weights are due to differences in the body weight between the two breeds. Farghaly and Asar (1988) reported that dressing percentage in Sudani ducks was 58.22% in males and 55.95% in females. Ali (2005) showed that average dressing percentage was 60.3% in Sudani ducks and 62.18 in Muscovy ducks at the same age (12 weeks). However present results showed higher dressing percentage, being 73.35 in Muscovy and 73.06 in Sudani ducks. The differences in the dressing percentage may be due to the difference in feeding, management and other factors.

Giblets percentage of Sudani duck was significantly ( $p<0.05$ ) higher than that of Muscovy ducks (4.80 vs 4.37%), while absolute weight of giblets showed the reverse trend, being higher in Muscovy than in Sudani ducks (103.75 vs 86.75 g), due to higher body weight in Muscovy ducks (2440 vs 1800 g). Amount and percentage of carcass fat were significantly higher ( $p<0.05$ ) in Muscovy compared with Sudani ducks (5.63 vs 2.29%).

**Carcass cuts weights:** Carcass cuts weights are presented in Table 5 for Muscovy and Sudani breeds. Present results revealed that absolute and relative weights of breast and drumsticks were higher in Muscovy ducks compared to Sudani ducks. El-Soukkary *et al.* (2005) reported that Muscovy duck is significantly higher in commercial cuts yield including breast and drumstick than those of Pekin and Sudani ducks.

Absolute weights of neck, back, wings, thigh and loss of cuts were not significantly different between both breeds, while relative weights of neck, back, wings and thigh were significantly ( $p<0.05$ ) higher in Sudani than Muscovy ducks. The variation in absolute and relative weights of carcass cuts are due to differences in carcass weight and body measurement, in the two breeds. Ali (2005) reported that shank length, keel length and breast circumference were significantly longer at 4-12 weeks of age in Muscovy ducklings than Sudani ones, respectively.

**Chemical composition of carcass cuts:** Chemical composition of breast and leg meat is presented in Table 6. Current results indicated that percentages of moisture and ether extract were significantly ( $p<0.05$ )

different in breast and leg cuts between the two breeds. Moisture percentage was higher ( $p<0.05$ ) while ether extract percentage was lower ( $p<0.05$ ) in breast and leg meat of Muscovy ducks as compared to Sudani ducks. Ash percentage was lower ( $p<0.05$ ) in breast meat of Muscovy ducks than Sudani ducks, while it tended to be lower in leg meat of Muscovy ducks than Sudani ducks. Protein percentage in breast and leg meat was similar in the two breeds. Inconsistent results were obtained by El-Soukkary *et al.* (2005) who found that the ash content was slightly higher in Sudani muscles than in Muscovy duck. Ali (2005) showed that percentage of protein in carcass cuts was superior in Sudani breed and ether extract was increased in Muscovy ones as compared to the other breed.

It is concluded that Muscovy ducks had better productive performance than Sudani ducks. Moreover, Muscovy ducks had higher percentages of carcass fat, breast and drumsticks than Sudani ducks. Meat of Sudani ducks is characterized by its lower percentage of moisture with higher percentages of ether extract and ash than meat of Muscovy ducks.

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