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GROWTH POTENTIAL AND CARCASS YIELDS OF EXOTIC AND INDIGENOUS GUINEA FOWLS IN GHANA

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ABSTRACT

Two hundred exotic ISA ESSOR guinea fowls (EGF) from Belgium were raised together with 306 indigenous guinea fowls (IGF) from day-old to 18 weeks of age under the same management scheme. The results indicated an overall improved growth performance of the EGF and consequently, higher carcass yields than the IGF. For instance, while the EGF gained 7.9g, 13.0g, 19.4g and 31.1g per day in the 2nd, 3rd, 4th and 5th weeks of growth respectively, the IGF gained 3.6g, 9.0g, 5.0g and 6.4g respectively within the same period. Similarly, the body weights gained by the end of the 10th, 11th and 12th weeks were 1295g, 1455g, and 1579g respectively for the EGF while the corresponding respective weights for the IGF were 618g, 638g and 651g. Mortality by the end of 18 weeks was 8.0% in the EGF and 49.7% in the IGF. While the respective bled and dressed weights of the EGF were 1912.50g and 1466.67g, those of the IGF were only 1045.83g and 782.61g respectively. All the carcass components of the EGF weighed about twice as much of those of the IGF.

Key words: *Exotic guinea fowl, indigenous guinea fowl, growth performance and carcass yields.*

INTRODUCTION

The Gray-breasted and helmeted guinea fowls (*Numida meleagris*) are indigenous to West Africa (Payne, 1990; Blakely and Bade, 1994). They perform valuable functions such as provision of income and protein (Awotwi, 1987 and Adam, 1997), act as watch-dogs on plantations, homes and control of insects on fruits and vegetable farms (Blakey and Bade, 1994). Not withstanding the indispensable role guinea fowls play in Northern Ghana (Adam, 1997), contemporary poultry literature indicates very little scientific studies of the bird (Huges and Sloan, 1984; Awotwi, 1987; Marks, 1990; Somes, 1990; Magnanga and Haule, 1998).

To upgrade and improve the productivity and income generation of the local breed, exotic ISA ESSOR guinea fowls were imported from Belgium by the Smallholder Agricultural Development Project (SADEP) in Tamale for distribution to farmers by the District Directories of the Ministry of Food and Agriculture. The objectives of this study were: (i) to compare the productive potential of the indigenous breed with the exotic ISA ESSOR breed raised under the same condition and (ii) to underscore the need for the upgrading of the indigenous breed.

MATERIALS AND METHODS

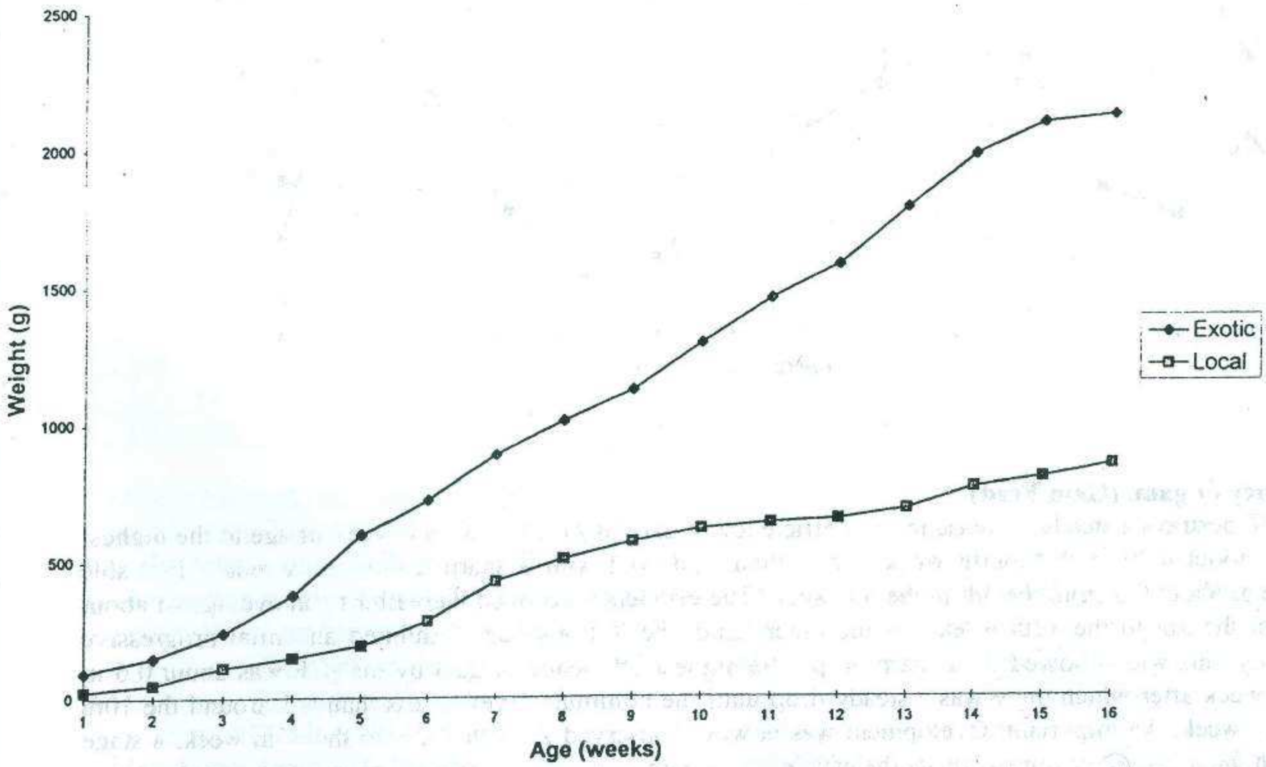
Two hundred exotic ISA ESSOR guinea fowl (EGF) keets from a commercial cross from Belgium were brooded and raised to maturity at the Nyankpala Campus of the University for Development Studies, (UDS), together with 306 indigenous guinea fowl (IGF) keets hatched at Pong-Tamale. Nyankpala is within the Guinea Savanna Zone with minimum and maximum average temperatures of 15^{0}C (Dec to Jan) and 42^{0}C (March and April) respectively. The rainfall pattern is unimodal (May – Oct.). The average rainfall per annum is about 1060 mm. Both breeds received the same management practices (brooding, housing, feeding, medication, etc.). Data collected were; daily weight gain, feed intake per week, mortality rate, rate of gain and feed conversion efficiency. At 18 weeks old, 24 birds (all males) were selected from each breed and slaughtered for carcass evaluation. Data collected include; live weight, bled weight, (weight of the carcass after bleeding but before defeathering), dressed weight, dressing percent and carcass yield (weight of the thighs, drumstick, neck, head, breast, wings and legs.). Portioning of the carcass was as described by Silverside and Jones (1992). The eviscerated and chilled carcasses were halved by cutting under the breast bone and through the joint of the thoracic and the fused lumbo-sacral vertebrae. The drumsticks were cut off the thigh through the joint of the femur and the fibula and tibia. The wings were severed at the joint between the humerus and the coracoid. The major parts were manually deboned after weighing. The boneless and bone portions were also weighed. Data analyses were by descriptive statistics as described by Fleming and Nellis (1994).

RESULTS AND DISCUSSION

Mean weight gain

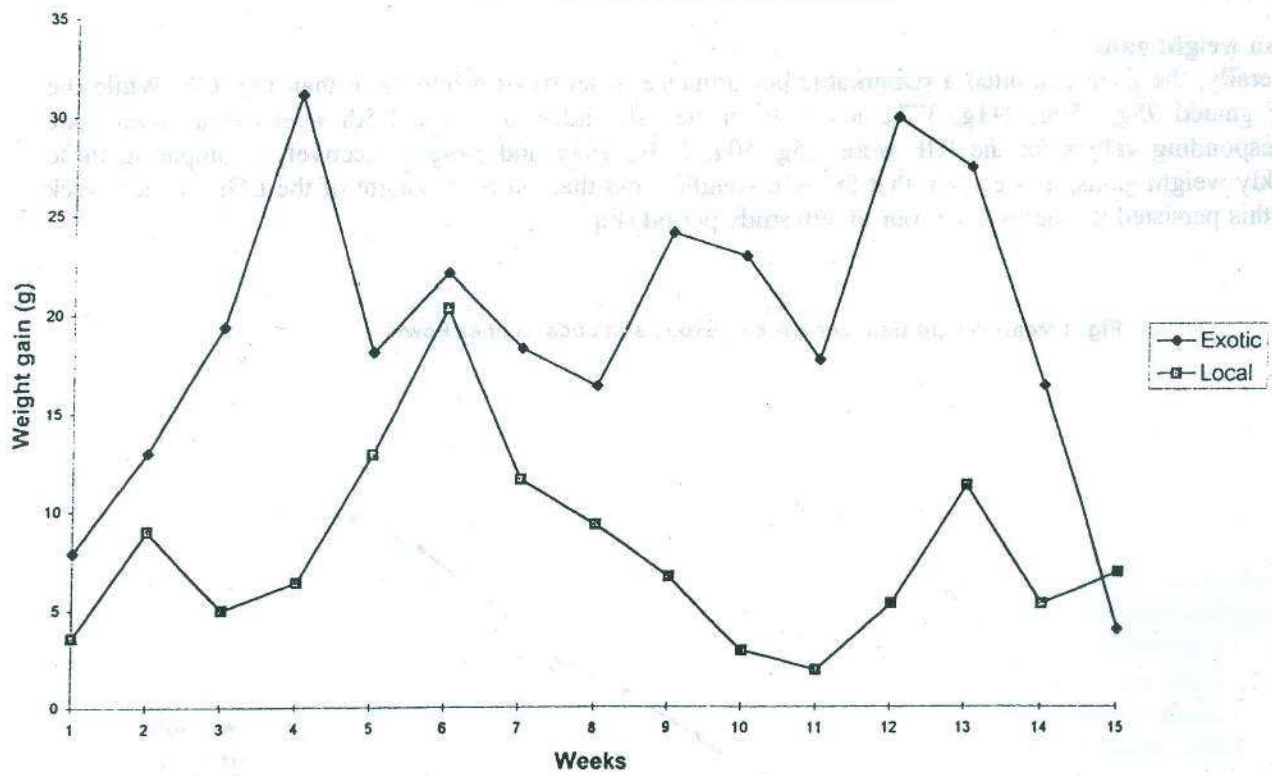
Generally, the EGF exhibited a remarkable performance in terms of weight gain than the IGF. While the EGF gained 95g, 150g, 241g, 377g and 598g in the 1st, 2nd, 3rd, 4th and 5th weeks respectively, the corresponding values for the IGF were, 25g, 50g, 113g, 148g and 149g respectively. Comparing these weekly weight gains, it is evident that the IGF weighed less than half the weight of the EGF in each week and this persisted throughout the four month study period (Fig 1).

Fig. 1 Mean Weight Gain per week of Exotic and Local Guinea Fowls



Rate of weight gain
The rate of weight gain further depicts the superiority of the exotic breed over the local breed. However, both breeds exhibited an undulating pattern of rate of gain (Fig 2). The respective weight gains per day by the EGF in the first five weeks were 7.9, 13, 19.4, 31.1 and 18.1g. While the rate of gain for the IGF were 3.6, 9.0, 5.0, 6.4 and 12.9g respectively for the first five weeks. Rate of gain in the EGF shot up from the beginning peaking at the fourth week, thereafter remained relatively high with another peak at the 12th week of age. There was a sharp decline in the gain pattern from the 13th weeks indicating that if the EGF were being raised as broilers then they should be sold by the end of the 12th week when the body weight may be about 1.6kg. The IGF had the peak gain in the 6th week. Thereafter, it dropped to a minimum in the 11th week before peaking again at the 13th week of age. Unlike the EGF, the IGF continued with the fluctuating rate of gain after the second peak. It is therefore not possible to predict the market age for the local broiler. However, it may be by the end of the 13th week of age when the body weight may be about 700g.

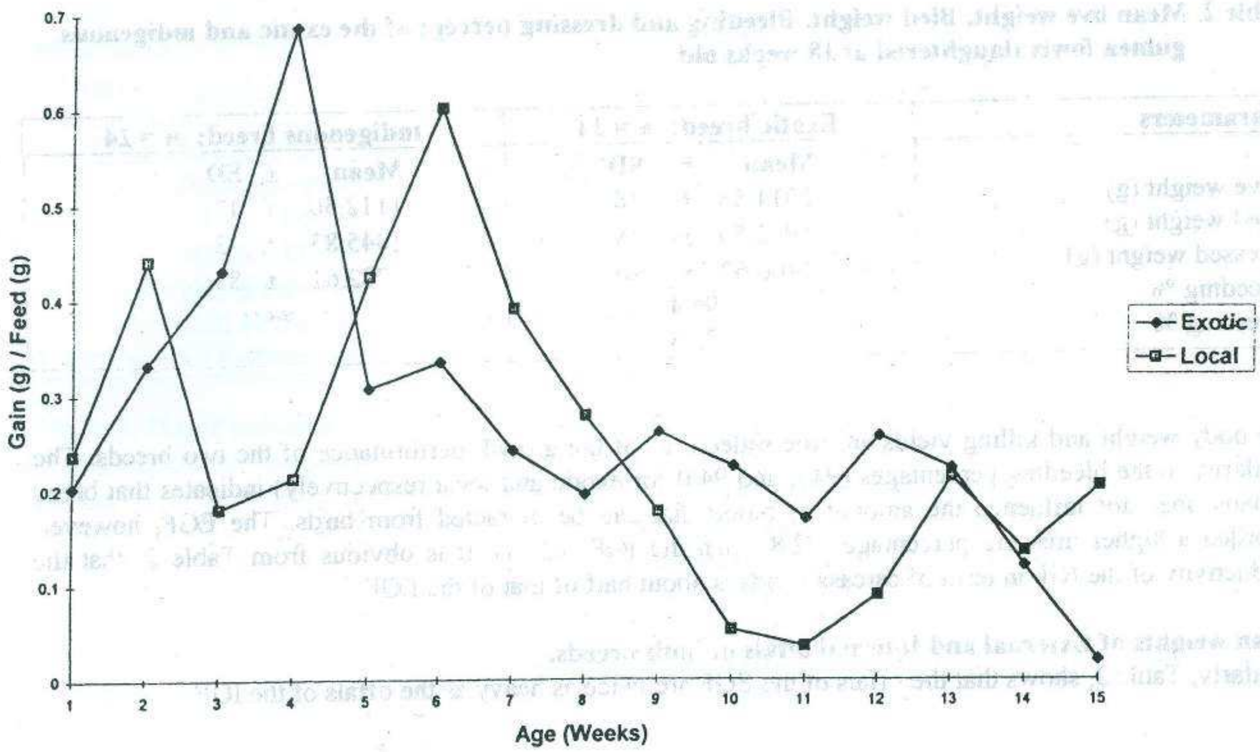
Fig. 2 Rate of weight gain of Exotic and Local Guinea Fowls



Efficiency of gain. (Gain/Feed)
The EGF portrays a steady increase in their efficiency of gain (0.2) from the first week of age to the highest ratio of about 0.70 in the fourth week (fig.3) then, followed with a sharp decline to a relatively stable average of about 0.3 from the 5th to the 6th week. The efficiency declined thereafter to an average of about 0.2 from the 7th to the 12th week. On the other hand, the IGF although exhibited an initial progressive efficiency, this was followed by a sharp drop. The highest efficiency of gain by the IGF was about 0.6 in the 6th week after which there was a steady drop until the minimum level of less than 0.1 around the 10th and 11th week. An important development was however observed from the 12th to the 13th week, a stage at which the local breed almost equals the efficiency of gain of the exotic breed. The graph generally shows

that the IGF have a comparable potential for feed conversion, which can be improved with intensive selection of outstanding individuals.

Fig 3. Efficiency of Gain of Exotic and Local Guinea fowls



Mortality rate

The mortality rate among the exotic breed for the first 8 weeks (brooding period) was 5%. (Table 1). The 5% loss was caused by infections such as yolk sac and leg paralysis.

Table 1. Cumulative Mortality rates among the Indigenous and Exotic Breeds from day-old to the 18th week of age.

Age (weeks)	Exotic Breed (EGF)	Indigenous Breed (IGF)
1st - 8th	5.0 %	33.0 %
1st – 18th	8.0 %	49.7 %

By the 18th week, the total mortality in the exotic breed was 8%. The local breed however, recorded a very high mortality rate (33 %) within the brooding period. The major cause of death was due to the strange feeding habit exhibited by the IGF keets. They ingested sharp and strange objects such as nails, pieces of wood and ropes from the litter which got stuck in the gizzard, while the keets of the EGF which were on the same litter did not ingest those objects. There were also some cases of yolk sac and leg paralysis. The cumulative mortality by the 18th week for the local breed was 49.7 %. The high keet mortality in the local breed in this study is in consonance with what was reported by Harpreet *et al* (1993) and Adam (1997).

It was observed that, the local keets were more nervous, fragile and inquisitive feeders. It must be stated that special care such as very clean litter devoid of any strange objects like nails and rope, and frequent entry into the brooder house, needs to be taken when brooding the local breed to ensure better survival rate.

Live weight and killing yields

Means of body weight at slaughter and killing yields of the two breeds are in Table 2.

Table 2. Mean live weight, Bled weight, Bleeding and dressing percent of the exotic and indigenous guinea fowls slaughtered at 18 weeks old.

Parameters	Exotic breed: n = 24	Indigenous breed: n = 24
	Mean ± SD	Mean ± SD
Live weight (g)	2014.58 ± 18	1112.50 ± 13
Bled weight (g)	1912.50 ± 18	1045.83 ± 13
Dressed weight (g)	1466.67 ± 16	782.61 ± 83
Bleeding %	94.4	94.0
Dressing %	72.8	70.4

The body weight and killing yields are true reflections of the growth performance of the two breeds. The similarity in the bleeding percentages (94.4 and 94.0 for exotic and local respectively) indicates that breed perhaps does not influence the amount of blood that can be extracted from birds. The EGF, however, recorded a higher dressing percentage (72.8) than the IGF (70.4). It is obvious from Table 2. that the productivity of the IGF in term of carcass yields is about half of that of the EGF.

Mean weights of External and Internal offals of both breeds.

Similarly, Table 3, shows that the offals of the EGF are twice as heavy as the offals of the IGF.

Table 3. Mean weights of external and internal offals and their percentages of carcass weight for exotic and indigenous breeds

Offals (g)	Exotic breed		Indigenous breed	
	Mean ± SD	% of carcass wt.	Mean ± SD	% of carcass wt
Head	136.82 ± 23	9.33	50.0 ± 12	6.37
Empty Gizzard	111.54 ± 42	7.81	50.0 ± 20	6.39
Full intestines	157.62 ± 33	10.75	82.71 ± 19	10.57
Heart, spleen & liver	118.50 ± 37	8.08	48.33 ± 60	6.18
Legs	124.25 ± 31	8.47	50.0 ± 30	6.39
Neck	111.07 ± 23	7.61	49.1 ± 20	6.38

The values in Table 3, show that the edible offals of the EGF will contribute more to meat supply than the offals from the IGF.

Mean weights of joints (major cuts) of both breeds.

Mean weight of the major cuts (portions) of both the IGF and EGF are presented in Table 4. Mean weights for the breast, thighs, drumsticks and wings were higher in the exotic than the local breed.

Table 4. Mean weights of joints (major cuts) and their components in the carcass of Indigenous and Exotic Guinea Fowls

Major cuts	Exotic Breed			Indigenous Breed		
	Whole (g)	Boneless (g)	Bones (g)	Whole (g)	Boneless (g)	Bones (g)
Breast	511.50 ± 31	427.55 ± 25	83.64 ± 12	268.17 ± 31	22.02 ± 90	48.15 ± 50
Thighs	540.83 ± 49	429.50 ± 45	111.33 ± 17	282.50 ± 21	224.07 ± 70	58.42 ± 80
Drumsticks	210.83 ± 29	177.07 ± 25	33.75 ± 11	114.93 ± 12	96.15 ± 70	18.78 ± 20
Wings	201.33 ± 30	159.27 ± 29	51.09 ± 40	116.17 ± 14	81.36 ± 70	34.81 ± 40

The carcass yields of the exotic breed is more than twice that of the local breed. This is an indication that barring any oganoleptic differences, more revenue may be derived from the exotic breed than the local breed.

Major cuts and their components as percent of carcass weight of indigenous and exotic guinea fowls. The contribution of the various cuts or joints and their component to the carcass weight as shown in Table 5, were similar for both breeds.

Table 5. Major cuts and their components as percent of carcass weight of local and exotic guinea fowls.

Breeds		Major Cuts as percent of carcass weight			
		Breast	Thighs	Drumsticks	Wings
Exotic	Whole (%)	34.9	36.9	14.4	13.7
	Boneless (%)	29.2	29.3	12.1	10.9
	Bone (%)	5.7	7.6	2.3	3.5
Local	Whole (%)	34.3	36.1	14.7	14.8
	Boneless (%)	28.1	28.6	12.3	10.4
	Bone (%)	6.2	7.5	2.4	4.4

In both breeds, the thighs contributed higher proportion to the carcass weight than the breast. It is also explicit that the contributions of bone and muscle components of the two breeds were similar. This shows that there is no anatomical difference in the two breeds and that, the huge difference between the total carcass weights is due to muscle development.

CONCLUSION

From the results on growth performance and carcass yields obtained in this study, the local breed or indigenous guinea fowl needs to be developed and improved to enhance its productivity. It was evident from the study that though the same amounts of resources were spent on both breeds, expected output and therefore income levels can not be the same. Intensive selection based on individual outstanding performance coupled with well-planned crossbreeding program is necessary to improve the meat production potential of the indigenous guinea fowl.

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