

Studies on the Possibility of Improvement of
Body Weight, Growth Rate and Vitality in

Bedouin Fowl

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Chicks obtained from eggs of Sinai fowl (control and selected groups for egg number) as well as from Fayoumi eggs were used in this experiment. Body weight was estimated at 12, 16 and 20 weeks of age. Growth rates and vitality percentages were estimated from hatch up to 12, 16 and 20 weeks of age.

The comparison made between Sinai and the local breed (Fayoumi) showed that Fayoumi Chickens were heavier than Sinai Chickens at the ages of 16 and 20 weeks.

Fayoumi fowl grew faster than Sinai breed, which could be attributed to the improvement made on Fayoumi breed, while Sinai breed is still a premature one.

In general, vitality was higher in Sinai than in Fayoumi chickens during the period from hatch to 20 weeks of age.

This study indicated that Sinai fowl is a premature breed and no improvement programs were applied. Therefore, any genetic and/or environmental improvement would lead to an improvement in body weight and growth rate.

Many investigations have been made on the Fayoumi chickens. In the effect of different brooding systems on growth rate of Fayoumi chickens, Ghany et al., (1975) found that the body weights at 12 weeks of age for those hatched in December were 622g. and 591g. when brooded on floor and in bataries, respectively. Mostager et al. (1975) reported the body weight of Fayoumi chickens at the same age to be 548.7g. and 477.6g. for male and female chickens.

Soltan (1976) studied the effect of inbreeding on body weight. He reported that body weights of the control males were 525.6 and 749.9g at 12 and 12 weeks of age, respectively. The respective values for females were 488.3g. and 704.0g.

Goher et al. (1938) reported that body weights of Fayoumi chicken were 410,563 and 757g at 12, 16 and 20 weeks respectively when brooded on floor and were 387,582 and 768g at the same ages when brooded in cages. The corresponding values in Baladi chickens were 433,600 and 819g on floor and 424,613 and 868 in cage.

There is no available literature on Sinai breed regarding these traits under study.

The present work was conducted to continue the previous investigation on Sinai fowl regarding body weight and growth rate during the brooding period at 12,16 and 20 weeks of age in order to get more information about that breed. Comparison was made with the local Fayoumi breed.

Material and Methods

Egg produced from Sinai fowl (control and selected groups for egg-number during the first three months of production, F₁) as well as eggs from Fayoumi breed were incubated together in the hatching incubator at the poultry Farm of the Faculty of agriculture, Monoufia University during the last week of August and first week of September, 1985.

Chicks obtained were numbered using wing numbers at hatch-time. They were brooded on floor. Temperature was controlled using electrical heaters. Chicks were fed ad lib. on diet containing 20% crude protein and about 2800Kcal. ME/kg feed. Chicks were weighed biweekly to the nearest gram at 12,16 and 20 weeks of age.

Growth rate of each chicken was calculated during the period from hatch-12, hatch-16 and hatch-20 weeks of age using the equation of Brody (1945). Vitality percentage was also estimated from hatch up to the different ages.

Data were statistically analyzed using Abstat program

from Anderson and Bell (1981). Analysis was made at Micro Computer of Depax of Department of Animal Production, Faculty of Agriculture, Monoufia University Shebin El-Kom.

Results and Discussion

Data in Table (1) reveal that female chickens of Sinai selected-fowl were smaller in body weight than the control group. While selected males were heavier than the control males. However, these differences were not significant.

Within the selected-Sinai chickens the differences between males and females were significant in favour to males. Although not significant, the same trend was observed for the control. This may be due to the effect of selection for egg number in the parental generation, from which these chickens were obtained. As a correlated response, this led to a decrease of the female body weights. Solt et al. (1986) reported a negative correlation between egg number and body weight in Sinai chickens.

The comparison made between Sinai and the local breed (Fayoumi) showed that Fayoumi chickens are heavier than Sinai chickens at the ages of 16 and 20 weeks.

Figures (1 and 2) indicate that the smallest body weights at 20 weeks of age were 464.5 and 399.2g for Sinai male and female chickens. The heaviest body weights were 1253g for males and 1075.8g for females.

Fayoumi breed was generally heavier than Sinai fowl. However, within Sinai breed there was about 12% females and 26% males weighing more than 1 kg. This would indicate that the selection for the heavier body weights in Sinai fowl is possible (C.V. 24-27% vs. 17.9-21.4% for Fayoumi).

These values are in agreement with those reported by Mostager et al. (1975), Ghany et al. (1975) and Goher et al. (1983) for chickens at 12 weeks of age. They are also in harmony with the findings of Soltan (1976) and Goher et al. (1983) for chickens at 16 and 20 weeks of age.

The relationships between body weights of Sinai and Fayoumi males and females at different ages are presented in Tables (2 and 3). In general, there was a slightly positive

relationship. However, it was more pronounced at 16 and 20 weeks than at 12 weeks of age. The same trend was observed for both breeds.

Table (4) illustrates the growth rate of chickens during the different periods of growth. Generally, the control males grew faster than those in the selected group. On the contrary, females showed the opposite trend. Sinai females were faster in their growth than the selected males. This may be due to the effect of selection for dams only in parental generation and the smaller body weights of females at hatch, 12 and 16 weeks of age than in males.

Generally, females of all chickens grew at faster rate during the period of 16-20 weeks of age compared with the other periods. It was also noted that Fayoumi fowl grew faster than Sinai breed, which could be attributed to the improvement made on Fayoumi breed, while Sinai breed is still a premature one.

Body weight of the selected-Sinai males was 33g higher than the control at 20 weeks of age. Meanwhile, the growth rate was 18.7% in favour to the control group. Body weight at hatch was higher in the selected chickens than the control which led to a faster growth rate in the control group.

Body weight of females at 20 weeks was 6.1g smaller in the selected group than the control group, while growth rate was almost the same.

It is apparent that Fayoumi chickens grew at a faster rate than selected-Sinai in both males and females (Table 4) while in comparison with the control group it was obvious that growth rate was almost similar in males and a little faster in female-Fayoumi chickens. This may be due to the effect of selection for egg number in Dams on both body weight and growth rate of the chickens.

The vitality percentage in Sinai and Fayoumi fowl is presented in Table (5). In general vitality was higher in Sinai than Fayoumi chickens, especially during the period from hatch to 20 weeks of age. However, it was higher in Fayoumi than Sinai chickens during the period from hatch to

12 weeks of age.

It is worthy to note that the mortality occurred in Sinai fowl revealed its susceptibility to leukosis disease.

The present study indicated that Sinai fowl is a premature breed and no improvement programs were applied. Therefore, any genetic and/or environmental improvement would lead to an improvement in body weight and growth rate. Sinai fowl is also characterized by the higher vitality during the brooding period.

In the next phase of the study the genetic relationships (genetic correlation) and the genetic values of the different economic traits, and the effect of selection on the other associated characters will be estimated to gain more information about that breed to help in designing the suitable breeding program to improved the different economic characters of that breed.

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Table 1 : Average body weight of Sinai and Fayoumi breeds.

Age	Sex	Sinai		Fayoumi			
		X + SE	C.V	X + SE	C.V		
12 weeks	M	392.3 + 14.3 ^a	22.2	387.9 + 22.3 ^a	24.4	337.2 + 10.4 ^a	23.8
	F	357.6 ^{ns} + 18.4 ^a	37.4	347.7 + 12.0 ^a	17.6	281.8 + 8.4 ^a	30.5
16 weeks	M	750.2 + 23.8 ^a	24.4	564.1 + 38.9 ^a	28.2	605.6 + 21.6 ^a	25.0
	F	486.6 + 20.8 ^a	27.6	510.0 ^{ns} + 23.5 ^a	21.1	491.2 + 16.1 ^a	27.7
20 weeks	M	824.5 + 40.3 ^a	24.9	791.5 + 59.3 ^a	28.0	945.1 + 26.6 ^b	17.9
	F	711.6 + 33.8 ^a	27.3	717.7 ^{ns} + 34.6 ^a	20.9	821.8 + 24.8 ^a	21.4

ns, differences between two sexes in the same age and the same breed were not significant.

** , differences between two sexes in the same age and the same breed were highly significant (P 0.01).

a,b, values having different superscripts within each row are significantly different (P 0.05).

M,male; F, female.

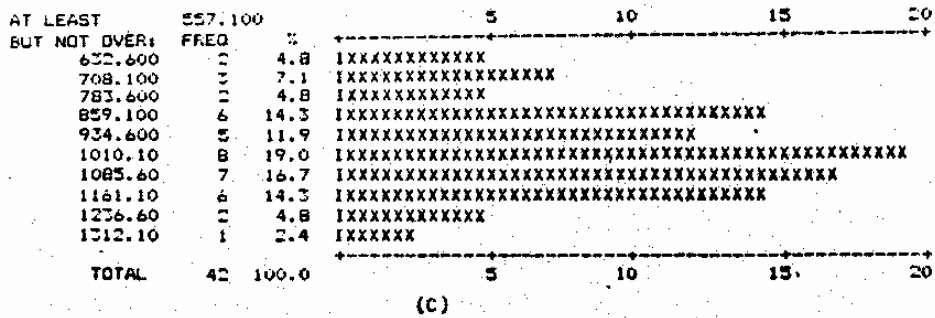
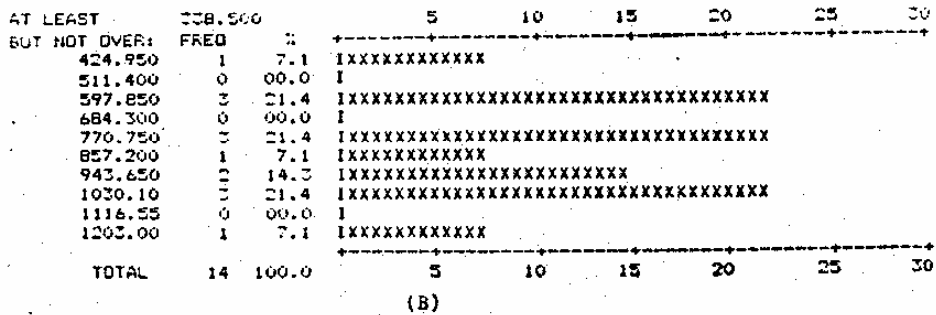
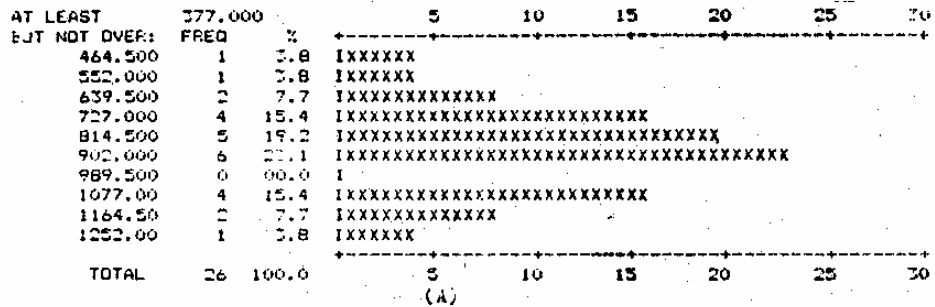


Fig. 1: Distribution of males body weights at 20 weeks of age for selected Sinai, A; control Sinai, B; and Fayoumi, C chickens.

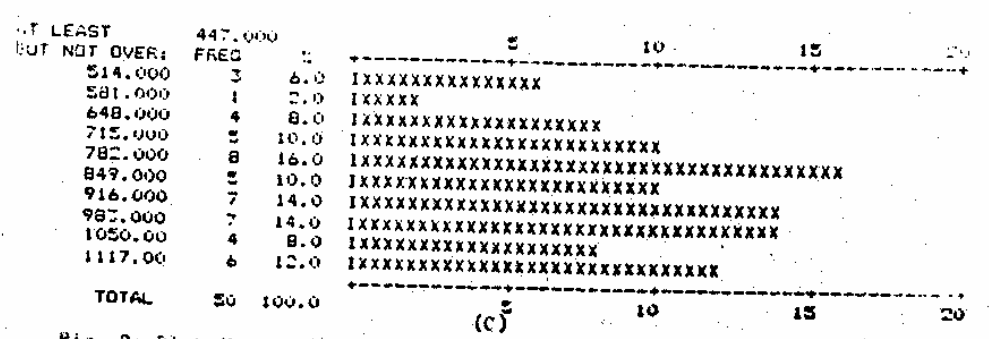
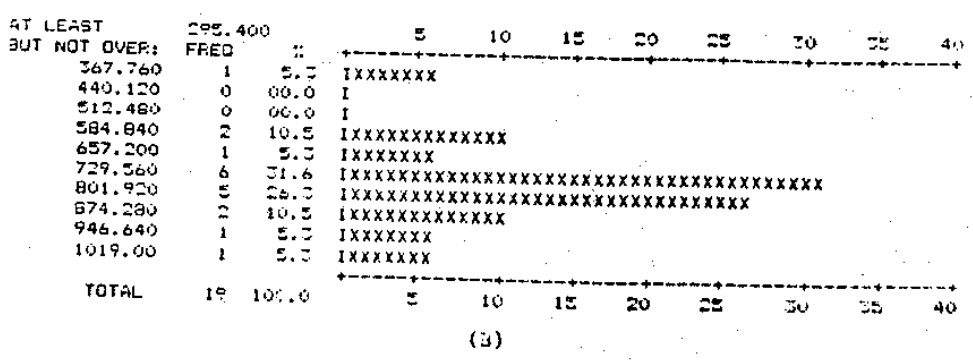
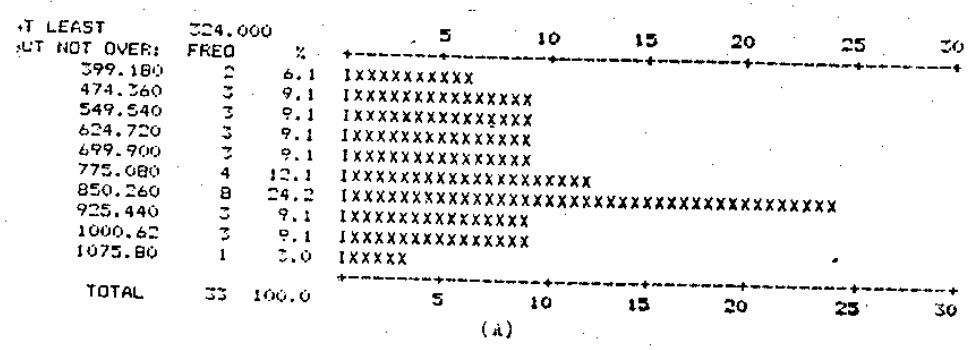


Fig. 2: Distribution of females body weights at 20 weeks of age for selected Sinai, A; control Sinai, B and Fayoumi, C chickens.

Table 2 : Relationships between body weights of Sinai males and females at different ages.

	12 weeks	16 weeks	20 weeks
12 weeks	---	0.11	0.11
16 weeks	0.09	---	0.25
20 weeks	-0.01	0.25	---

Table 3: Relationships between body weights of Fayoumi males and females at different ages

	12 weeks	16 weeks	20 weeks
12 weeks	---	0.05	0.08
16 weeks	0.02	---	0.13
20 weeks	-0.40	0.15	---

Table 4 : Growth rate of Sinai and Fayoumi chickens.

Period	Sex	Sinai		Fayoumi		
		Selected X ± SE	C.V	Control X ± SE	C.V	
8 -12 weeks	M	65.4 ± 2.7 ^a	26.3	51.7 ± 5.4 ^b	43.1 45.8 ± 2.0 ^b	33.6
	F	70.6 ^{ns} ± 4.7 ^a	48.7	62.7 ^{**} ± 2.3 ^b	20.4 41.6 ± 1.3 ^c	30.3
12-16 weeks	M	44.2 ± 3.0 ^a	39.6	49.1 ± 4.5 ^a	35.1 58.6 ± 3.2 ^b	36.8
	F	58.7 ^{**} ± 5.9 ^a	68.2	38.7 ± 3.8 ^b	46.6 55.8 ± 1.4 ^a	21.6
16-20 weeks	M	43.1 ± 3.9 ^a	48.1	51.6 ± 6.4 ^b	43.2 47.6 ± 4.0 ^{ab}	50.4
	F	82.2 ^{**} ± 9.1 ^a	65.4	43.1 ± 7.0 ^b	72.8 58.6 ± 4.5 ^c	53.7
Hatch-12weeks	M	143.2 ± 7.2 ^a	33.5	167.2 ± 3.1 ^b	8.1 169.0 ± 2.9 ^b	6.9
	F	163.5 ^{**} ± 4.1 ^a	16.3	164.9 ^{ns} ± 2.4 ^a	7.6 165.6 ± 1.5 ^a	11.3
Hatch-16weeks	M	160.4 ± 8.7 ^a	32.1	163.9 ± 11.4 ^a	28.0 179.5 ± 1.8 ^b	6.9
	F	168.3 ^{ns} ± 3.8 ^a	13.6	170.1 ± 6.7 ^a	17.7 173.2 ± 2.0 ^a	9.3
Hatch-20weeks	M	167.7 ± 7.3 ^a	23.3	186.4 ± 1.5 ^a	2.9 186.5 ± 2.3 ^b	7.3
	F	181.9 ^{**} ± 1.3 ^a	3.8	181.1 ± 2.4 ^a	5.6 186.5 ± 2.8 ^a	9.6

ns, differences between two sexes in the same age and the same breed were not significant.

** , differences between two sexes in the same age and the same breed were highly significant. (p < 0.01).

a,b,c, values having different superscripts within each row are significantly different (p < 0.05)
M, male ; F, female.

Table 5: Vitality percentages of Sinal and Fayoumi chickens.

Period	Sinal		Fayoumi	
	Selected X ± SE	Control X ± SE	Selected X ± SE	Control X ± SE
8-12 weeks	94.2 ± 2.9	86.6 ± 2.8	98.5 ± 0.0	98.5 ± 0.0
12-16 weeks	92.9 ± 2.9	91.0 ± 2.6	85.3 ± 0.0	85.3 ± 0.0
16-20 weeks	92.5 ± 3.2	84.2 ± 3.6	94.4 ± 0.0	94.4 ± 0.0
Hatch-12 weeks	89.3 ± 3.8	75.6 ± 3.3	95.0 ± 0.0	95.0 ± 0.0
Hatch-16 weeks	83.6 ± 4.2	71.5 ± 3.8	81.8 ± 0.0	81.8 ± 0.0
Hatch-20 weeks	83.3 ± 4.3	62.2 ± 4.4	77.3 ± 0.0	77.3 ± 0.0

امكانية التحسن في
وزن الجسم ومعدل النمو والحيوية
في دجاج البسندو

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استخدم في هذا البحث كتايت متحصل عليها من بيض دجاج
سينا سواء المنتج لزيادة عدد البيض أو العادى وكذلك من دجاج
الفيومى .

وقد قدر وزن الجسم عند أعمار ١٢ ، ١٦ ، ٢٠ أسبوع وقد ر
معدلات النمو ونسبة الحيوية أثناء الفترات من الفقس وحتى عمر
١٢ ، ١٦ ، ٢٠ أسبوع من العمر .

وبمقارنة دجاج سينا بالفيومى اتضح أن أوزان الجسم فى
الفيومى كانت أكبر منها فى دجاج سينا فى أعمار ١٦ ، ٢٠ أسبوع .
كما اتضح أن متوسط معدل النمو فى الفيومى كان أكبر منه
فى دجاج سينا الذى قد يرجع للتحسينات التى أجريت على دجاج
الفيومى بينما لم يجرى ذلك على دجاج سينا .

وعامة فان نسبة الحيوية فى دجاج سينا كانت أعلى منها فى
الفيومى من وقت الفقس وحتى عمر ٢٠ أسبوع .

ومن هذه الدراسة اتضح أن دجاج سينا يعتبر مادة خام
لم تنلها يد التحسين بعد . وأنه باجراء التحسين الوراثى
أو البيئى سوف يؤدى الى التحسين فى وزن الجسم ومعدل
النمو