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## A COMPARATIVE STUDY AMONG THREE PARENTAL BROILER STOCKS UNDER EGYPTIAN CONDITIONS

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**ABSTRACT:** This study was conducted to evaluate the effects of Egyptian conditions on body weight, feed conversion ratio, mortality rate and shank length of three parent stocks. These strains were (Hubbard, Arbor Acres and Cobb) brooded and reared in the same environmental conditions. Each strain consisted of 120 females and 50 males. The birds were fed according to the program feeding of producer Company. Results showed that there were significant ( $P \leq 0.05$ ) differences in body weight, feed conversion ratio, mortality rate and shank length among strains at different periods. Initial body weight was significantly higher in Cobb than other two strains (Hubbard and Arbor Acres). However, final body weight at 8 weeks was significantly higher in Hubbard than other strains (Cobb and Arbor Acres). Moreover, was improved feed conversion ratio of Hubbard strain as compared to Cobb and Arbor Acres throughout the experimental period. No mortality rate found in males of Arbor Acres but female of Hubbard was low mortality in different ages. Initial shank length of Arbor Acres was longer than other two strains Cobb and Hubbard. However, the final shank length of Hubbard was longer than in Cobb and Arbor Acres under Egyptian conditions.

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**Key words:** Broiler breeder strain, body weight, feed conversion ratio, shank length

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**INTRODUCTION**

The poultry industry is improved due to implement these changes, genetic improvements have focused primarily on selection for growth rate, feed conversion ratio and degree of muscling causing in commercial poultry. During the last 50 years, the amount of time required to reach market weight and the quantity of feed needed to produce one kg of meat have been reduced by 50% (Anthony, 1998).

High ambient temperature is one of the most important factors inhibiting poultry production in many regions of the world. There has been a rapid increase in the number of farmers owning broiler parent and grandparent stocks leading to an increase in the population of meat type chicken in Egypt.

Presently common three strains of broiler breeder stocks are available in Egypt, namely, Arbor Acres, Hubbard and Cobb. There is limited published research dealing with birds grown to the weights now demanded for further processing. The objective of this study was to determine the best strain of body weight, feed conversion ratio and shank length of broiler breeders reared under Egyptian climate.

**3. Material and Method:**

**3.1. Site of Study:**

The present experiment was carried out at Ismailia / Masr Poultry Company, during the period from June 2013 to March 2014. All data on the chicken performance were taken through this period.

**Experimental Design:**

The experiment consisted of 3 × 2 factorial arrangement of treatments with 3 commercial broiler breeder strains. The 3 strains included in the trial were Hubbard, Arbor Acres and Cobb.

**Experimental birds, feeding trial and lighting program:**

A number of 50 males and 120 females from each parent were used chicks were wing banded at one day of the hatch. The chicks were brooded and reared under the same environmental condition, in a closing

house on the floor rearing house. The program of diet was done according to company program as shown in table (1). The light program for the pullets was 24 hours per day at the first three days of housing after that lighting was reduced one hour each 2days until eight hours per day. The vaccination was done for all chicks according to the company program.

**Data Collection:-**

Body weights were recorded per chick at one day, 4 and 8 weeks of age to nearest 0.1 gm. Feed conversion ratio was calculated from one day to 4 weeks, 4 weeks to 8 weeks and one day to 8 weeks. According to the following equation:

$$\text{Feed conversion ratio} = \frac{\text{feed in take through period}}{\text{body weight gain for the same period}}$$

,mortality was calculated monthly as follows if occurred according to: Mortality% =

**Number of dead parent**

$$\frac{\text{Number of dead parent}}{\text{Total number of parent at start}} \times 100$$

,shank length was determined on live birds by measuring the length of the shank (from the top of the hock joint to the foot pod) with a caliper (in millimeters) at one day, 4weeks and 8weeks).

**Statistical Analysis:-**

The data were subjected to analysis of variance procedures appropriate for a completely randomized design using the General Linear Model procedures of SAS institute (2003). Means and standard error were compared using the Duncan multiple range (Duncan 1955). Difference were considered significant at p<0.05. Data were analyzed by using the following linear fixed model:

$$Y_{ijk} = \mu + B_i + S_j + (BS_{ij}) + E_{ijk}$$

Where:

$Y_{ijk}$  = the observation of the  $ijk$  records;

$\mu$  = the overall mean;

$B_i$  = the fixed of breed,  $i=1-3$ ;

$S_j$  = the fixed of sex,  $j=1-2$ ;

(BS<sub>ij</sub>)= the interaction between breed and sex;

E<sub>ijk</sub>= random error.

## **RESULTS AND DISCUSSIONS:**

### **4.1. Body weight**

#### **1.1. Body weight at one day:**

average body weight at one day for males of the three broiler breeders strain are present in Table (2). They were 63.3, 45.3 and 49.8 gm. for Cobb, Hubbard and Arbor Acres, respectively. Also, the corresponds figures for females were 77.2, 40.4 and 53.5 gm. Moreover, average body weight of two sexed for each strain was 73.6, 42.1 and 52.4 gm. The differences between three broiler breeder lines were significant ( $P < 0.05$ ). Under Egyptian conditions, the body weight of Cobb broiler breeder at one day was significantly higher than the other strains (Hubbard and Arbor Acres). The body weight of Males and females for Cobb were significantly higher than males and females of the other strains (Hubbard and Arbor Acres). Similar results were found by Robinson et al (2007) they stated that Hubbard, Ross 508 and Ross 708 were significant difference in body weight at one day of age. Also, Salo-ojo and Ayorind (2009) reported that there were significant differences in body weight of genotypes at one day of age where Dominant black strain (DBC) had higher values than Fulami Ecotpe Chicken (FEC). In the same trend, Ojedapo et al. (2012) reported that Bovan Nera black (NB) was significantly higher than black shaver black (BL) at one day old.

#### **1.2. Body weight at 4 weeks:**

Overall means of body weight at 4weeks for males of the three broiler breeders strain are found in Table (2). They were 607.9, 554.1 and 651.8 gm for Cobb, Hubbard and Arbor Acres, respectively. In addition, the corresponds figures for females were 411, 459.6 and 421.04 gm. The average body weight of two sexed for each strain was 463.7, 490.8 and 488.5 gm. The differences between three broiler breeder lines were

significant ( $P < 0.05$ ). Under Egyptian conditions, The body weight of Hubbard broiler breeder at 4weeks was significantly higher than the two strains (Cobb and Arbor Acres) while males of Arbor Acres were significantly higher than males of other strains and females of Hubbard were the higher than females of other strains (Cobb and Arbor Acres). Similar results were reported by Reboinson et al. (2007) stated that Hubbard, Ross 508 and Ross 708 were significant different on body weight at 4weeks Also, Salo-ojo and Ayorind (2009) observed that there were significant differences in body weight of genotype at 4 weeks of age with Dominant black strain (DBC) having higher value than Fulami Ecotpe Chicken (FEC). As well as, ojedapo et al.(2012) reported that Bovan Nera black (NB) was higher than black shaver(BL) at 4 weeks.

#### **1.3. Body weight at 8 weeks:**

Overall means of body weight at 8 weeks for males of the three broiler breeders strain are found in Table (2). They were 1115.48, 1028.3 and 1061.73gm for Cobb, Hubbard and Arbor Acres, respectively. Also, the corresponds figures for females were 712.4, 848.9and 658.2gm. As well as, the average body weights of two sexed for each strain were 816.6, 911and 776.4 gm. The differences between three broiler breeder lines were significant ( $P < 0.05$ ). It was found that the interactions between body weight and sex were significant (table 2) these interactions were mostly due to the differences between males and females were different for example the female of cobb breeder were 63% related to there males. The relative figures were 86% and 62% for Hubbard and Arbor Acres, respectively. Under Egyptian conditions, the body weight of Hubbard broiler breeder at 8weeks was significantly higher than the two strains (Cobb and Arbor Acres), while males of Cobb were significantly higher than males of other strains, females of Hubbard were significantly higher than females of other strains. Similar results

were found by Salo-ojo and Ayorind.(2009) who found that there were significant differences in body weight of genotype at 4 weeks of age with Dominant black strain (DBC) having higher value than Fulami Ecotpe Chicken (FEC) and Kosarachukwu et al. (2010) reported that Ross and Arbor Acres had no significant different but Anak was lowest than other strains at 8 weeks . Reboinson et al (2007) found not significant difference between strains (Hubbard, Ross 508 and Ross 708).

## 2. Feed conversion ratio:

### 2.1. Feed conversion ratio from 1day to 4weeks:

Least square means of feed conversion ratio from 1day to 4weeks for males of the three broiler breeders strain are present in Table (3). They were 1.5, 1.5 and 1.3 (Feed intake/wt.gain) for Cobb, Hubbard and Arbor Acres, respectively. Also, the corresponds figures for females were 2.4, 1.9 and 2.1 (Feed intake/wt.gain). The differences between three broiler breeder lines were significant ( $P < 0.05$ ). The average feed conversion ratio of two sexed for each strain was 2.1, 1.7 and 1.9 (Feed intake/wt.gain). The differences between three broiler breeder lines were significant ( $P < 0.05$ ). Under Egyptian conditions, the Feed conversion ratio of Hubbard broiler breeder from 1days to 4weeks was better than other strains (Arbor Acres and Cobb) while males of Arbor Acres were better than males of two strain (Cobb and Hubbard) at the same period but females of Hubbard were better than females of other strains.

### 2.2. Feed conversion ratio from 4weeks to 8 weeks:

Least square means of feed conversion ratio from 4 weeks to 8 weeks for males of the three broiler breeders strain are present in Table (3). They were 1.8, 1.9 and 2.2 (Feed intake/wt. gain) for Cobb , Hubbard and Arbor Acres, respectively. As well as, the corresponds figures for females were 2.8, 2.2 and 3.6 (Feed intake/wt. gain). The average Feed conversion ratio of two

sexed for each strain was 2.5, 2.1 and 3.2 (Feed intake/wt. gain). The differences between three broiler breeder lines were significant ( $P < 0.05$ ). Under Egyptian conditions, the Feed conversion ratio of Hubbard broiler breeder from 4weeks to 8weeks was better than the two strains (Arbor Acres and Cobb) while males of Cobb were better than males of two strains (Arbor Acres and Hubbard) at the same period but females of Hubbard were better than females of other strains.

### 2.3. Feed conversion ratio from 1day to 8 weeks:

Least square means of feed conversion ratio from 1day to 8 weeks for males of the three broiler breeders strain are present in Table (3). They were 1.5, 1.6 and 1.6 (Feed intake/wt. gain) for Cobb, Hubbard and Arbor Acres, respectively. Also, the corresponds figures for females were 2.5, 1.9 and 2.6 (Feed intake/wt. gain). The average feed conversion ratio of two sexed for each strain was 2.2, 1.8 and 2.3 (Feed intake/wt. gain) for Cobb, Hubbard and Arbor Acres. The differences between three broiler breeder lines were significant ( $P < 0.05$ ). It was found that the interactions between Feed conversion ratio and sex were significant Table (3). These interactions were mostly due to the differences between males and females were different for example the female of Arbor Acres breeder were 68.8% related to there males. The relative figures were 17.6% and 60% for Hubbard and Cobb, respectively. Under Egyptian conditions, the feed conversion ratio of Hubbard broiler breeder from 1day to 8weeks was better than the two strains (Arbor Acres and Cobb) and females of Hubbard were better than females of other strains while Kosarachukwu et al. (2010) noted that no significant difference between three broiler breeder (Ross, Arbor Acres and Anak).

## 3. Mortality Rate:

There was difference in mortality rate between three broiler breeders (Cobb, Hubbard and Arbor Acres) in table (4) .

Female of Arbor Acres broiler breeder was higher than other strain at different ages. However, Males of Hubbard was higher than other strain at different ages. Similar results were found by Islam R., N. Kalita and P. Nath (2014) who reported that there was significant ( $P \leq 0.05$ ) difference in mortality rate between Vanaraja and indigenous chicken during 0 to 5 weeks of age which might be due to improper artificial brooding in Vanaraja chicks. Later on the mortality rate decreased with the advancement of age in both the cases Ghosh et al. (2005) also reported higher mortality percentage of 22.63% in Vanaraja up to 6 weeks of age in high altitude of Arunachal Pradesh. They also recorded highest mortality during the brooding period.

#### 4. Shank length:

##### 4.1. Shank length at one day:

Least square means of the shank length at one day for males of the three broiler breeders strain are present in Table (5). They were 15.6, 24.4 and 24.9 mm for Cobb, Hubbard and Arbor Acres, respectively. Also, the corresponds figures for females were 16.3, 21.9 and 23.9 (mm). As well as, the average shank length of two sexed for each strain was 16.1, 22.7 and 24.2 (mm) for Cobb, Hubbard and Arbor Acres, respectively. The differences between three broiler breeder lines were significant ( $P < 0.05$ ). Under Egyptian conditions, the shank length of Arbor Acres broiler breeder at one day was significantly longer than two strains (Hubbard and Cobb). While, males of Hubbard and Arbor Acres were significantly longer than males of Cobb and females of Arbor Acres was significantly longer than females of the other strain. Similar results were found by Reboinson et al. (2007) who showed that Ross 708 was significantly longer than other strains (Hubbard HI-Y and Ross 508) at one day and ojedapo et al. (2012) reported that Nera black was significantly longer than Brown shaver strain at one day.

##### 4.2. Shank length at 4 weeks:

Least square means of shank length at 4 weeks for males of the three broiler breeders strain are present in Table (5). They were 56.2, 53.3 and 54.5mm for Cobb, Hubbard and Arbor Acres, respectively. As well as, the corresponds figures for females were 49.6, 48.3 and 51.1 (mm). Also, the average of two sexed for each strain were 51.4, 50 and 52.1 (mm). The differences between three broiler breeder lines were significant ( $P < 0.05$ ). Under Egyptian conditions, The shank length of Cobb broiler breeder at 4weeks was significantly longer than two strains (Hubbard and Arbor Acres) while males of Hubbard and Arbor Acres were significantly longer than Cobb, females of Arbor Acres were longer than females of other strains and similar results were found by Reboinson et al. (2007) that Hubbard HI-Y and Ross 708 was significantly longer than other strains Ross 508 at 8 weeks and ojedapo et al.(2012) found that Nera black was longer than Brown shaver strain at 4weeks.

##### 4.3. Shank length at 8 weeks:

The overall means of shank length at 8 weeks for males of the three broiler breeders strain are present in Table (5). They were 70.4, 69.5 and 67.9mm for Cobb, Hubbard and Arbor Acres, respectively. Also, the corresponds figures for females were 60.6, 62.7 and 60.7 (mm). The average of two sexed for each strain was 63.1, 64.7 and 62.7 (mm). The differences between three broiler breeder lines were significant ( $P < 0.05$ ). Under Egyptian conditions, the shank length of Hubbard breeder at 8 weeks was significantly longer than (Cobb and Arbor Acres), while males of Hubbard and Cobb were significantly longer than Arbor Acres but females of Arbor Acres were significantly longer than females of other strains and Similar results were reported by Reboinson et al. (2007) stated that Ross 708 was significantly longer than other strains (Hubbard HI-Y and Ross 508) at

8weeks and ojedapo et al.(2012) showed that Nera black was significantly longer than Brown shaver strain at 8 weeks

**CONCLUSION**

This study indicated that Hubbard broiler breeder strain showed better values for body weight and Feed conversion (BW and FC) as well as shank length.

**Table (1):** The feeding composition according to Ismailia / Masr Poultry Company in Parent farms:

<b>Composition</b>	<b>Pre starter Percent</b>	<b>Growing feeder Percent</b>
Yellow corn	61.4	62.25
Soybean meal46%	30	18.1
wheat bran	4.5	15.6
Di calcium phosphates	1.9	1.72
Limestone	1.2	1.3
Salt	0.4	0.4
Salt parent 1	0.3	0.3
Methionine	0.2	0.1
Vitamin parent 1	0.1	0.1
Oxice Titrasiceleen <sup>R</sup>	0	0.13
Vitamin c	0	0
Gluten 60%	0	0
Salt parent 2	0	0
Vitamin parent 2	0	0
manganese Sulfate	0	0
Lysine	0	0
Grow max <sup>R</sup>	0	0
Lino mex <sup>R</sup>	0	0
Hidy <sup>R</sup>	0	0
Total	100	100

**Broiler Breeder Strain, Body Weight, Feed Conversion Ratio, Shank Length.**

**Table (2):** Means and Standard Errors ( $\bar{x} \pm$  S.E.) Of body weight (gm) at different ages of the three broiler breeder lines.

Strains		Ages					
		1day		4weeks		8weeks	
		N	$\bar{x} \pm$ S.E.	N	$\bar{x} \pm$ S.E.	N	$\bar{x} \pm$ S.E.
Cobb 500	male	44	47.8 $\pm$ 0.7 <sup>b</sup>	41	607.9 $\pm$ 18.3 <sup>b</sup>	38	1115.5 $\pm$ 31.5 <sup>a</sup>
	female	124	45.5 $\pm$ 0.3 <sup>b</sup>	112	411 $\pm$ 4.8 <sup>b</sup>	109	712.4 $\pm$ 8.6 <sup>b</sup>
	Total	168	46.1 $\pm$ 0.3 <sup>b</sup>	153	463.7 $\pm$ 9.3 <sup>b</sup>	147	816.6 $\pm$ 17.9 <sup>b</sup>
Hubbard	male	44	45.3 $\pm$ 0.9 <sup>c</sup>	41	554.1 $\pm$ 14.5 <sup>c</sup>	37	1028.3 $\pm$ 25.3 <sup>b</sup>
	female	86	40.4 $\pm$ 0.4 <sup>c</sup>	83	459.6 $\pm$ 4.7 <sup>a</sup>	70	775.3 $\pm$ 6.8 <sup>a</sup>
	Total	130	42.1 $\pm$ 0.5 <sup>c</sup>	124	490.8 $\pm$ 7 <sup>a</sup>	107	862.8 $\pm$ 13.8 <sup>a</sup>
Arbor Acres	male	47	51.2 $\pm$ 0.5 <sup>a</sup>	45	651.8 $\pm$ 13.1 <sup>a</sup>	41	1061.73 $\pm$ 25.4 <sup>ab</sup>
	Female	121	53.5 $\pm$ 0.5 <sup>a</sup>	109	421.04 $\pm$ 4 <sup>b</sup>	99	669.4 $\pm$ 6.1 <sup>c</sup>
	Total	168	52.8 $\pm$ 0.4 <sup>a</sup>	154	488.5 $\pm$ 9.7 <sup>a</sup>	140	784.29 $\pm$ 17.4 <sup>b</sup>
Male		135	48.2 $\pm$ 0.5 <sup>A</sup>	127	606.1 $\pm$ 9.5 <sup>A</sup>	116	1068.7 $\pm$ 16.1 <sup>A</sup>
Female		331	47.1 $\pm$ 0.4 <sup>B</sup>	304	427 $\pm$ 2.9 <sup>B</sup>	278	712.91 $\pm$ 6.6 <sup>B</sup>

a,b,c means within the same column with different letters for males and females are different significantly .

<sup>A,B,C</sup> means within the same column with different letters for strains are different significantly .

**Table (3):** Means and Standard Errors ( $\bar{x} \pm$  S.E.) of feed conversion ratio at different periods for the three lines:

Strains		Ages			
		1day-4weeks	4weeks-8weeks	1day-8weeks	
		N	$\bar{x} \pm$ S.E.	$\bar{x} \pm$ S.E.	$\bar{x} \pm$ S.E.
Cobb 500	male	38	1.46±0.1 <sup>a</sup>	1.8±0.1 <sup>b</sup>	1.54±0.1 <sup>a</sup>
	female	108	2.2±0.03 <sup>a</sup>	2.8±0.1 <sup>b</sup>	2.4±0.03 <sup>b</sup>
	Total	146	2±0.04 <sup>a</sup>	2.8±0.1 <sup>b</sup>	2.4±0.04 <sup>b</sup>
Hubbard	Male	37	1.5±0.05 <sup>b</sup>	1.9±0.1 <sup>ab</sup>	1.7±0.04 <sup>a</sup>
	Female	70	1.9±0.03 <sup>b</sup>	2.2±0.1 <sup>c</sup>	2±0.02 <sup>c</sup>
	Total	107	1.7±0.03 <sup>c</sup>	2.1±0.1 <sup>c</sup>	1.9±0.03 <sup>c</sup>
Arbor Acres	male	41	1.3±0.04 <sup>b</sup>	2.2±0.1 <sup>a</sup>	1.6±0.1 <sup>a</sup>
	Female	99	2.1±0.02 <sup>a</sup>	3.6±0.1 <sup>a</sup>	2.7±0.02 <sup>a</sup>
	Total	140	1.9±0.04 <sup>b</sup>	3.2±0.1 <sup>a</sup>	2.4±0.1 <sup>a</sup>
male		116	1.4±0.03 <sup>B</sup>	1.9±0.07 <sup>B</sup>	1.6±0.03 <sup>B</sup>
female		277	2.1±0.02 <sup>A</sup>	2.9±0.05 <sup>A</sup>	2.4±0.2 <sup>A</sup>

a,b,c Means within the same column with different letters for males and females are different significantly .

A,B,C Means within the same column with different letters for strains are different Significantly.



**Broiler Breeder Strain, Body Weight, Feed Conversion Ratio, Shank Length.**

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**Table( 4):** Mortality rate for different ages of the three broiler breeds

Strain	sex	Mortality rate%		
		1 day-4week	4 weeks-8week	8week-12week
Cobb	male	0	6	0
	female	4	2	0.7
Hubbard	male	6	0	6
	female	2.7	0.7	0.7
Arbor Acres	male	0	0	0
	female	6.7	0	4

Note: Results not tested statistically because the mortality data were few

**Table (5):** Means and Standard Errors ( $\bar{x} \pm \text{S.E.}$ ) of shank length (mm) at different ages of the three broiler breeder lines

Strains		Period's					
		1 day		4 weeks		8 weeks	
		N	$\bar{x} \pm \text{S.E.}$	N	$\bar{x} \pm \text{S.E.}$	N	$\bar{x} \pm \text{S.E.}$
Cobb 500	male	44	15.6±0.4 <sup>b</sup>	41	56.2±0.6 <sup>a</sup>	38	70.4±0.8 <sup>a</sup>
	female	124	16.3±0.2 <sup>c</sup>	112	49.6±0.5 <sup>ab</sup>	109	60.6±0.4 <sup>a</sup>
	Total	168	16.1±0.1 <sup>c</sup>	153	51.4±0.4 <sup>a</sup>	147	63.1±0.05 <sup>b</sup>
Hubbard	male	44	24.4±0.3 <sup>a</sup>	41	53.3±0.5 <sup>a</sup>	37	69.5±0.7 <sup>a</sup>
	Female	86	21.9±0.3 <sup>b</sup>	83	48.3±0.4 <sup>b</sup>	70	62.7±0.7 <sup>a</sup>
	Total	130	22.7±0.3 <sup>b</sup>	124	50±0.4 <sup>b</sup>	107	64.7±0.5 <sup>a</sup>
Arbor Acres	male	47	24.9±0.4 <sup>a</sup>	45	54.5±0.5 <sup>a</sup>	41	67.9±0.7 <sup>a</sup>
	female	121	23.9±0.2 <sup>a</sup>	109	51.1±0.5 <sup>a</sup>	99	60.7±0.4 <sup>a</sup>
	Total	168	24.2±0.2 <sup>a</sup>	154	52.1±0.4 <sup>a</sup>	140	62.7±0.5 <sup>b</sup>
male		135	21.7±0.4 <sup>A</sup>	127	54.7±0.4 <sup>A</sup>	116	68.9±0.5 <sup>A</sup>
female		331	20.5±0.2 <sup>B</sup>	304	49.8±0.3 <sup>B</sup>	278	61.1±0.3 <sup>B</sup>

a,b,c means within the same column with different letters for males and females are different significantly .

A,B,C means within the same column with different letters for strains are different significantly.

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## الملخص العربي

### دراسة مقارنة بين ثلاث سلالات من امهات التسمين تحت الظروف البيئية المصرية

محمد عبد المنعم كسبه، حسن زويل، سليمان عبد الرحمن زهران ، محمد عبد الحميد الشافعي  
طه محمد محمد

قسم الانتاج الحيواني والسمكي- كلية الزراعة - ساها باشا - جامعة الاسكندرية  
قسم انتاج الدواجن - كلية زراعة - جامعة الاسكندرية  
شركة اسماعلية / مصر للدواجن- مدينة سرايوم - محافظة الاسماعلية

اجريت التجربة لدراسة ومقارنة بعض الصفات الانتاجية علي ثلاث سلالات من كئاكيت امهات التسمين (الكب و الهبرد والاربورايكرز) تحت تاثير الظروف البيئية المصرية . وتم تربية ورعاية الثلاثة سلالات تحت نفس الظروف البيئية . وتم استخدام ١٢٠ انثي و ٥٠ ذكر من كل سلالة . السلالات الثلاثة تم تغذيتها وفقا لبرنامج التغذية بالشركة . اظهرت النتائج فروق معنوية ( $p < 0.05$ ) في كلا من وزن الجسم وكذلك معدل التحويل الغذائي و نسبة النفوق وطول الساق بين الثلاث سلالات علي فترات مختلفة من العمر . تحت الظروف البيئية المصرية سجلت سلالة الكب اعلى وزن مقارنا بالسلالتين ( الهبرد والاربورايكرز) في بداية الفترة ولكن تفوقت عليها سلالة الهبرد مقارنا بالسلالتين ( الكب والاربورايكرز) في اخر فترة التجربة . وكذلك تحسن معدل التحويل الغذائي في الهبرد عن السلالتين ( الكب والاربورايكرز) خلال فترة التجربة . لا يوجد نفوق في ذكور الاربورايكرز وكانت اناث الهبرد الاقل في نسبة النفوق بين السلالات في اعمار مختلفة ولكن الفترة الاولي من قياس طول الساق كانت الاربورايكرز هي الاطول في طول الساق عن باقي السلالات ( الهبرد والكب).ولكن في نهاية فترة التجربة كانت الهبرد هي الاطول في طول الساق عن باقي السلالات (الاربورايكرز والكب) تحت الظروف البيئية المصرية.