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أدآء دجاج اللحم فى مزارع مختلفة بمعدلات تحويل غذائى مختلفة تحت الظروف المصرية

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الملخص العربى

فى هذه الدراسة تم تجميع البيانات المختلفة عن الآداء الإنتاجى لعنابر دواجن مختلفة الكثافات وكذلك مختفة فى معدل التحويل الغذائى تحت الظروف المصرية ، وتم تحليل تلك البيانات لدراسة أداء هذه العنابر . وقد تم دراسة صفات وزن الجسم عند أعمار مختلفة ، ونسب الحيوية ، ومعدلات النمو ، كفاءة العنبر ، دليل تكوين الدهن و الدليل الإنتاجى الأوروبى .وهذه الدراسة تلقى الضوء وتقدم معلومات هامة وحديثة عن إنتاج لحوم الدجاج فى مصر .

PERFORMANCE OF BROILER CHICKENS IN DIFFERENT FARMING WITH DIFFERENT FEED CONVERSIONS UNDER EGYPTIAN CONDITIONS

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ABSTRACT: *Data about the performance of broiler chickens in different houses with different stocking densities, and different feed conversions under Egyptian conditions were collected and analyzed. The studied traits were body weights, livability percentages, growth rates, efficiency of each house, fattening index and European productive index. This study introduces new information about broiler production in Egypt.*

Key words: *Broiler, Density of birds, feed conversion, Egypt.*

INTRODUCTION

Closed houses system was used in Egypt at different places specially in the new cultivated lands which have hot and subtropical weather. But Deaton *et al.* (1968) reported that, the environmental controlled houses was not unanimous regarding to operational recommendations, such as ventilation system and rate, optimal temperatures, density of birds, feed conversion of the strain …. etc., it was decided to solve local problems and if possible to develop an operational system that would fit the local broiler's breed and climatic demands. In most of developing countries such as Egypt the cost of producing 1 Kg meat of broiler chickens play a great roll for the economic efficiency of the house and also for the customers.

Recently, Renema *et al.* (2007) obtained that the continually increasing growth efficiency of the modern broilers has allowed the cost of production today to remain at a *similar* level to that of the 1950's. Havenstein *et al.* (2003) noticed that modern broiler stock can grow at 4.6 times the rate of a 1957 random bred strain. One major repercussion of this increased growth rate is a much smaller environmental impact of poultry production due to improved feed conversion. Another repercussion is the densities of birds / m^2 and the mortality rate at different ages. The present work is aimed to study such effects on broiler chickens productivity and the productive efficiency of different houses and farms under Egyptian conditions.

MATERIALS AND METHODS

The experiments were carried out in commercial ventilation type controlled environmental poultry houses. Data were collected every week and daily died chicks were recorded and also feed intake per house was recorded. The light system was 24 h light for 1 week, 23 h for the second week, 21 h from 3 – 5 weeks and 20 h for the last week. Temperature degrees were 34°C for the first week then were decreased 2°C weekly till 24°C in the last week. High requirements of biosecurity system were applied. Body weight at different ages, feed consumption per house and number of mortality birds were recorded daily in all farms.

RESULTS AND DISCUSSION

From economic analysis of Ebraheem K.S. (2008) obtained the effect of feed conversion and mortality rates on the cost of 1 Kg broiler chickens. It is clear that birds with better feed conversion and lower mortality rates produced cheaper meat cost per one Kg than those have a bad feed conversion and high mortality rates. A positive relationships was noticed between each of feed conversion and mortality rates with the cost of producing 1 Kg of broiler meat (Table 1). The same author in Table 2 presented the effect of densities (birds / m^2)

and mortality, rates on the cost of producing 1 Kg of broiler chickens. Data in Table (2) illustrates that, the high densities leads to cheaper cost of broiler meat production than lower densities. Also lower mortality rates reduced the cost of producing meat production. Both traits have a positive relationships with the cost of producing 1 Kg of broiler chickens.

Data *collected* from KARA Egyptian company (2012) were analyzed. Ross strain birds were reared under closed house system. Three different houses were used and broiler birds were reared till marketing age (39 days of age) and fed 4 commercial diets (super starting (1-3 days) diet) starting (4 - 11 days) diet, growing diet (12-28 days) and finishing diet 29-39 days. The composition of all diets were illustrated in Table 3.

All the 3 houses have light system of 24 h photoperiod from 1-10 days, 23 h from 11-16 days and 21 h from 17-39 days and each house have 50 lambs. The corresponding temperatures were 34°C for 1-3 days, 32.5°C (4-7 days), 31°C (8-20 days), 29-28°C for 21 to 30 days and 26 - 21°C for 31-39 days of age.

Data in Table (4) illustrated that feed conversion and mortality percentage during the growing period till marketing (1-39 days) played a great roll on meat production per (m^2) or per house, house efficiency and the productive efficiency or the European productive efficiency. The birds in house 1 were more efficient which have feed conversion of 1.846, 6.3 % mortality rate, 21.09 Kg meat production per m^2, 21087.35 Kg total meat production per house 1. Therefore, fattening index was 785.5, the house efficiency was 114.2% and the European productive efficiency was 188.7%. Where (Meltzer, 1980) reported the following equation:

$$\text{Fattening index} = (F.I) = \frac{\text{Mean body weight in gram}}{\text{Feed conversion}}$$

$$\text{House efficiency index} = (HEI) = \frac{\text{Meat production per } (m^2) \text{ in Kg} \times 100}{\text{Feed conversion}}$$

$$\text{European productive efficiency} = EPE\ \% = \frac{\text{Mean body weight (g)} \times \text{livability \%} \times 100}{\text{Feed conversion} \times \text{marketing age (days)}}$$

Table 1: The cost of Kg of broiler chickens meat production under Egyptian conditions according to changes in feed conversion and mortality rates (In Egyptian pound during 2008).

Morality rates %	Feed conversion				
	1.7	1.8	1.9	2.0	2.2
5	8.05	8.32	8.59	8.86	9.39
7	8.23	8.50	8.78	9.05	9.60
9	8.41	8.69	8.97	9.25	9.82
15	9.02	9.32	9.62	9.92	10.52

Table 2: The cost of 1 Kg of broiler chickens meat (in Egyptian pound)) under Egyptian conditions according to changes in densities (birds / M^2) and mortality rates during (2008).

Morality rates %	Densities (Birds / m^2)				
	10	14	16	14	19
5	8.86	8.49	8.37	8.32	8.24
7	9.06	8.67	8.55	8.50	8.42
9	9.26	8.87	8.74	8.69	8.61
15	9.93	9.51	9.38	9.32	9.23

From: Ebraheem (2008)

Table 3: Composition of Diets.

Ingredients	Super starting diet 1-3 days	starting diet 4-11 days	Growing diet 12-28 days	Finishing diet 29-39
Corn (mayze) (Kg)	515	514	579	657
Soybean (Kg) (48%)	370	370	317	236
Gluten (Kg)	70	60	40	40
Oil (Kg)	11	21	31	36
Mono calcium (Kg)	14	14	14	14
Limestone (Kg)	7	8	7	7
Premix (Kg)	4	4	4	4
Sodium chloride (Kg)	3.4	3.4	3.5	3.4
Methionine (Kg)	2.3	2.3	1.4	7
Lysine (Kg)	2.3	2.3	2.6	1.1
Anti coccidal drug (Kg)	1	1	-	-
Biocox (Kg)	-	-	0.5	0.5
Total	1000.0	1000.0	1000.0	1000.0
Calculated values :				
Crude Protein (%)	25.45	25.72	23.28	20.29
ME K cal / Kg diet	3059.55	3065.8	3147.73	3257.6
Calcium %	0.70	0.74	0.64	0.62
Total Phosphorus %	0.64	0.63	0.60	0.57

Table 4: Comparison between three different broiler houses (closed system) in KARA Farms, Egypt during 2012.

Traits	House 1	House 2	House 3
House area (m^2)	1000	1000	1000
No. of birds at beginning (1 day)	15522	15550	15525
No. of birds at end (39 day)	14543	13977	14841
Density of birds / m^2	14.5 m^2	13.9 /m^2	14.8 / m^2
Mortality %	6.3	10.1	4.4
Livability %	93.7	89.9	95.6
Mean body weight at 39 days (Kg)	1.450	1.493	1.450
Meat production (Kg) per m^2	21.09	20.87	21.51
Meat production (Kg) per house	21087.35	20867.66	21562.92
Feed conversion	1.846	2.02	2.09
Fattening index	785.5	739.1	693.8
House efficiency index (HEI)	114.2	103.3	102.9
European production efficiency %	188.7	107.4	170.4

Data presented in Table (5) showed live body weights at different ages (1, 7, 14, 21, 28, 35 and 39 days), mortality rates and livability rates at the previous ages. Heavier body weights at marketing age (39 day) was noticed in house two however house 1 have a higher meat production / m2 (21.09 Kg) than that in house 2 (20.87 Kg) this finding due to higher mortality mate in house (2) 10.1 % (during 1 – 39 days) than that obtained for house 1 (6.3 %).

Data in Table (6) illustrates that, the most growth in all houses were caused at the early ages then it will be decreased. The cumulative growth rates (Table, 7) at the marketing age (39 days) were 189.3 %, 188.3 % and 189.2 % for house 1, 2 and 3, respectively. It is clear that no significant differences between the three houses could be found. These trends may be controlled genetically under similar houses conditions. Soltan (1992), Mahgoub (2000), El Neny (2003) and Bessi (2006) were came to the similar finding.

Table 5: Comparison between body weights (g), mortality and livability (%) of the three houses.

Ages	Body weight (g)			Livability %			Mortality %		
	House			House			House		
Days	1	2	3	1	2	3	1	2	3
1 day	40	45	40	100	100	100	-	-	-
7 day	150	110	150	99.6	99.5	99.6	0.4	0.5	0.4
14 day	280	286	329	99.6	99.7	99.8	0.4	0.3	0.2
21 day	319	439	430	99.9	98.7	99.8	0.1	0.3	0.2
28 day	990	936	900	99.8	98.2	99.0	0.2	1.2	1.0
35 day	1350	1320	1350	94.9	94.8	97.5	5.1	5.2	2.5
39 day	1450	1493	1450	100.0	97.6	99.9	0.0	2.4	0.1
Total 1-39 days				93.7	89.9	95.8	6.3	10.1	4.2

Table 6: Interval growth rates, % (1–7, 7-14, 14-28, 28-35 and 35-39 periods).

Ages	Interval growth rates %		
	House 1	House 2	House 3
1 – 7 days	115.6 a	83.9 b	115.8 a
7 – 14 days	60.5 b	88.9 a	74.7 a
14 – 21 days	13.0 c	42.2 a	26.6 b
21 – 28 days	70.5 a	71.3 a	70.7 a
28 – 35 days	41.5 a	34.2 b	40.0 a
35 – 39 days	12.0 a	12.3 a	7.1 b

a, b, c : means with the same subscript in each raw were not differ significantly
P ≤ 0.05

Table 7: Cumulative growth rates (%) at (1–7, 1-14, 1-21, 1-28, 1-35 and 1-39 days) in different houses.

Ages	Cumulative growth rates %		
	House 1	House 2	House 3
1 – 7 days	115.8 a	83.9 b	115.8 a
1 – 14 days	150.0 a	145.6 b	156.7 a
1 – 21 days	155.4 b	162.8 a	165.9 a
1 – 28 days	180.1 a	181.7 a	182.9 a
1 – 35 days	184.5 a	186.8 a	188.4 a
1 – 39 days	189.3 a	188.3 a	189.2 a

a, b, : means with the same subscript in each raw were not differ significantly
P ≤ 0.05

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