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EFFECT OF THYROXIN AND ASCORBIC ACID ON HATCHABILITY AND GROWTH PERFORMANCE OF CHICKENS A LOCAL STRAIN.

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ABSTRACT

The experiment was conducted to study the effects of injecting or dipping Montazah eggs with different levels of ascorbic acid (AA) and Eltroxin (EL) on hatchability characteristics including hatchability rate, embryonic mortality and egg weight loss during incubation as well as on productive performance of chicks produced from different treatments, including body weight, weight gain, growth rate and feed conversion at 0-4, 4-8, 8-12 and 0-12 wk of age. Dipping recorded higher ($P<0.05$) values for all traits studied in comparing with injection technique. Treatment with AA had the highest ($P<0.05$) values for all traits studied compared with EL or control (distilled water). Dipping eggs with AA at a level of 0.5% had ($P<0.05$) the highest hatchability percentage, the lowest embryonic mortality. Chicks hatched of eggs dipped in AA at a level of 0.5% showed the highest ($P<0.05$) average body weight, weight gain and viability rate as well as the best feed conversion at hatch and at the end of the experimental period. Chicks of eggs injected with AA at a level of 1 mg/egg had the highest ($P<0.05$) growth rate at the end of the experimental period. From the economic point of view, the current study may conclude that dipping eggs in AA solution at a level of 0.5% had beneficial effects on hatchability characteristics and productivity of hatched chicks gained more in their body weight and more economic.

INTRODUCTION

Thyroid hormones are essential for normal growth and development of various body organs and systems. These hormones have the ability to stimulate oxygen consumption. Injected broiler eggs with Eltroxin at a level of 0.05 or 0.15 µg led to increased embryonic mortality and lower hatchability of chicken eggs when compared with control group (Samak, 1996). Also, Christensen (1985) reported that injecting Turkey eggs with TRH (3.7 ng/egg) improved hatchability and decreased embryonic mortality between 1 and 28 days of incubation. However, Gomma (1990) observed that injection of T4 causes high level of embryonic mortality for Hubbard eggs. But T4 conversion by injection with Lopanic acid decreased embryonic mortality (De Cuypere *et al.*, 1982).

Increasing thyroid hormones output accelerates all oxidative phosphorylation reactions and lowered growth rate of both meat and egg types of chicken (Parker, 1943 and Gado, 1973). Excessive levels of thyroid excrete had an adverse effect on productive organ while optimal physiological levels produce pre-mature sexual development in normal growing animal (Williams, 1965). Remarkable decrease in growth rate was found by inducing experimental hyper-thyrodism in chicks. The rate of increment differed according to thyroid treatment (Beaty *et al*., 1973) and the rate of reduction in average body weight due to thyroid treatment increased by advancing age (Soliman, 1982). Moreover, May (1979) reported that, chicks fed 1.0 ppm T3

(3,5,3 triiodothyronine) consistently had poorer body weight gain than controls, but feeding them with T4 (thyroxin) at the same dosage, did not affect gain in broiler chicks.

On the other hand Majeed *et al*. (1984) found that, live body weight gain increased by thyroxin treatment when young chicken of an egg laying strain were daily injected with 0, 1, 2, or 4 µg thyroxin per 100 gm body weight from the 7^{th} to 12^{th} weeks of age.

Eggs injected with either 0.5 or 1.0 µg Eltroxin of Hubbard broiler resulted in heavier body weight when compared with those of control group (Gomma, 1990).

Thyroxin plays an important role in the manifestation of dwarfism through its effect in feed utilization (Selvarajah *et al*., 1970). Tagel-din (2004). who found significant increase in hatchability percentage and lower embryonic mortality and egg weight loss during the incubation period the of fertile eggs by dipping into 10.0 g AA / .when compared with 0.0 g AA . Also Awad 2004 found that injection eggs at 0 day by 3 mg vit. C had better hatchability in ducks. However, Bayley *et al*. (1971) concluded that meat type dwarf chicken had a lower maintenance requirement per unit of weight than meat type normals.

Several studies are regarding the effect of ascorbic acid on growth, hormonal relationship, immunisupperssion, mortality and other traits in birds. Four approaches have been reported to study the effect of ascorbic acid as additive to diet (Orban *et al*., 1993. and Kutlu, 1994) injection of hen (Meglasson and Hozelwood, 1982) and crop incubation (Takahashi *et al*., 1991).

The increment of heat during the later stage of egg incubation may be expose chick embryos to stress (Tullet, 1990). Ascorbic acid considered as an anti-stress agent, so the addition of ascorbic acid may be beneficial for condition of embryonic stress. Ascorbic acid at a level of 3 mg during egg incubation improved hatchability, body weight at hatch and embryonic mortality (Zakaria *et al*., 1996). They added that, injection of ascorbic acid improved hatchability when injected on 11 and 15 days of incubation.

On the other side, Ascorbic acid is a weak acid and the ability of diluted acids to interact with egg shell cuticle was reported by (Burley and Vadehra, 1989). Treating egg shell with weak acid release carbon dioxide, enhance the movement of water vapor. Influence hatchability percentage of eggs (Meuer and Bauman, 1988; Burdy and Vadehra, 1989), egg shell conductance, embryonic mortality, culling chicks and chicks weight at hatch (Shafey, 2002).

MATERIALS AND METHODS

This study was carried out at Gimmizah Research Station, Animal Production Research Institute, Agricultural Research Center, Ministry of Agriculture during the period from september 2005 to February 2006.

A total number of 1350 eggs (53±0.2 g) obtained from Silver Montazah strain was divided into ten equal groups (135 eggs per group). Eggs were weighed individually and treated as follows:

Egg treatment:

The present study included 10 treatment groups, 5 injection treatments and 5 dipping treatments. In injection treatments, each egg was injected with 0.2 ml distilled water containing 1.0 (T1) or 0.5 (T2) mg from ascorbic acid (0.5 and 0.25 g/100 ml distilled water, respectively) or 0.10 (T3) and 0.15 (T4) µg from Eltroxin (50 and 75 µg/100 ml distilled water, respectively) as the following:

T1: 0.50% Ascorbic acid (AA) solution (1.0 mg/0.2 ml distilled water/egg).
T2: 0.25% AA solution (0.5 mg/0.2 ml of distilled water/egg).
T3: 50% Eltroxin (EL) solution (0.10 µg/0.2 ml distilled water/egg).
T4: 75% EL solution (0.15 µg/0.2 ml distilled water/egg).
T5: Control 0.0 g L AA EL (0.2 ml distilled water (/egg)

However dipping treatments were treated with the same levels of AA and EL as the following:

T6: 0.50% AA (0.50 g/100 ml distilled water).
T7: 0.25% AA (0.25 g/100 ml distilled water).
T8: 50% EL (50 µg/100 ml distilled water).
T9: 75% EL (75 µg/100 ml distilled water).
T10:Control 0.0 g L AA EL (0.2 ml distilled water (/egg).

Eggs were incubated at 37.6 °C and 55% relative humidity in Reform incubator for 18 days, and then eggs were weighed individually and examined by candling where infertile eggs and eggs containing dead embryos were removed. Eggs were transformed in the hatchary at 37.2 °C and 65% relative humidity. The rate of egg weight loss of each experimental group was calculated.

At the morning of the 22nd day of incubation period, the hatched chicks were counted, weighted for each treatment, then hatchability percentages and body weight at hatch were determined. Unhatched eggs were examined and the total rate of embryonic mortality (early and late dead embryos) was determined.

All chicks of different groups were reared under the same hygenic and environmental conditions for 12 weeks and growth performance parameters including, body weight, weight gain, growth rate, feed conversion (g feed/g weight) were recorded at hatch and four weeks intervals. At the end of experimental period viability rate and economic efficiency were calculated.

Statistical analysis:

The obtained data were subjected to analysis of variance as one way ANOVA, using the statistical analysis of SPSS ver. 10 (1997) and the differences between means were tested using Duncan's multiple range test (Duncan, 1955).

RESULTS AND DISCUSSION

Hatchability characteristics:

Data presented in table (1) show that dipping treatment significantly ($P<0.05$) improved all hatchability characteristics in term of higher hatchability percentage, lower embryonic mortality and lower egg weight loss during the incubation period than injection treatment.

Eggs treated with 1.0 mg AA significantly (P<0.05) showed the highest hatchability percentage, the lowest embryonic mortality and the lowest egg weight loss when compared with those treated with EL or control (distilled water). EL treatment showed moderate values, while the control eggs showed the lowest values (Table 1).

As affected by dose of treatment, it is of interest to note that the high dose of AA with dipping or injection treatment improved all hatchability characteristics (Fig. 1). The opposite was true with increasing dose of EL, but all doses from AA or EL showed higher values than the control. The dipping treatment with 0.50 g AA/100 ml showed significantly the highest hatchability percentage and the lowest embryonic mortality and egg weight loss as compared to other treatments (Fig. 1).

The observed improvement in hatchability characteristics for AA injection is in agreement with those of Zakaria *et al*. (1996), who reported that AA at a dose of 3 mg/egg during egg incubation improved hatchability and embryonic mortality. This may attributed to the fact that ascorbic acid considered as an anti–stress agent, so the AA treatment may be beneficial for enhancement of incubation condition. Tagel-din (2004). (2004) who found significant increase in hatchability percentage and lower embryonic mortality and egg weight loss during the incubation period the of fertile eggs by dipping into 10.0 g AA / .when compared with 0.0 g AA. Also Awad 2004 found that injection eggs at 0 day by 3 mg vit. C had better hatchability in ducks.

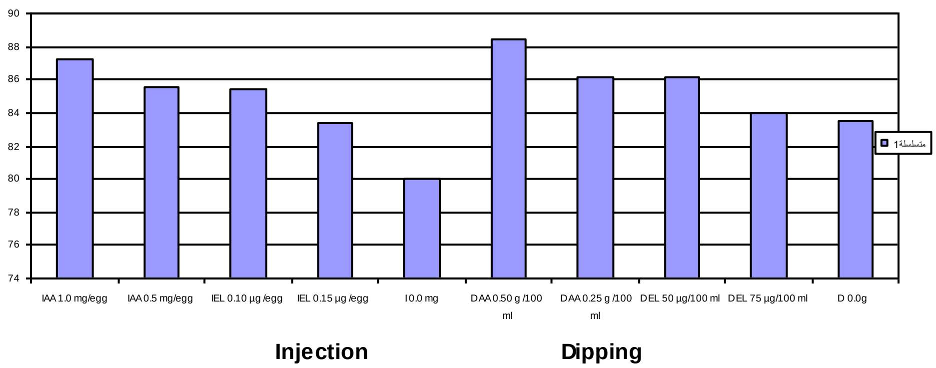
Table (1): Means and standard errors of hatchability, embryonic mortality and egg weight loss percentages as affected by technique, treatment and their interaction.

Variable	Hatchability (%)	Embryonic mortality (%)	Egg weight loss (%)
Effect of technique:			
Injection (I)	84.3 ± 0.01[b]	15.7 ± 0.02[a]	12.4 ± 0.01[a]
Dipping (D)	85.6 ± 0.01[a]	14.4 ± 0.01[b]	11.8 ± 0.01[b]
Effect of treatment:			
Ascorbic acid (1.0 mg)	87.8 ± 0.01[a]	12.2 ± 0.04[d]	11.5 ± 0.01[d]
Ascorbic acid (0.5 mg)	85.8 ± 0.01[b]	14.2 ± 0.04[c]	11.9 ± 0.01[c]
Eltroxin (0.10 µg)	85.8 ± 0.01[b]	14.3 ± 0.04[c]	12.3 ± 0.01[b]
Eltroxin (0.15 µg)	83.7 ± 0.01[c]	16.3 ± 0.04[b]	12.6 ± 0.01[a]
Control (0.0g DW)	81.8 ± 0.01[d]	18.3 ± 0.04[a]	12.3 ± 0.01[b]
Effect of interaction :			

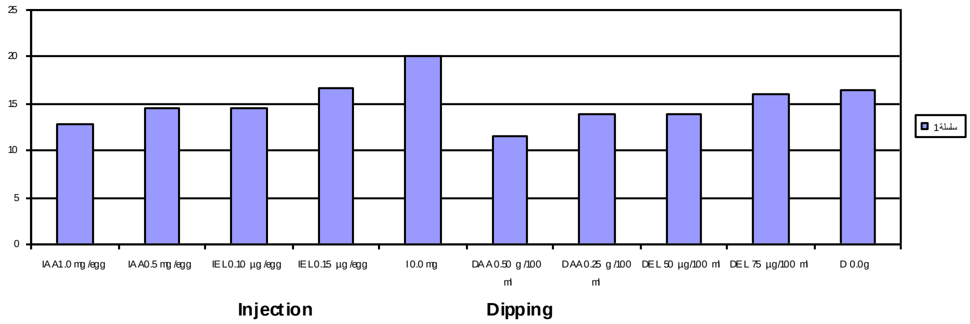
a,b,c… g: Means within the same column for each classification with different superscripts are significantly different (P<0.05)

The highest hatchability characteristics of eggs dipped in AA solution at a concentration of 0.5% may be attributed to that treatment of the eggshell with weak acid increased release of carbon dioxide (Romankewitsch, 1934), enhanced the movement of water vapor, change the buffering capacity of albumin (Meuer and Bauman, 1988 and Burely Vadehra, 1989) and decrease embryonic mortality (Shafey , 2002).

Hatchability percentages as affected by interaction



Embryonic mortality percentage as affected by interaction



Egg weight loss percentage as affected by interaction

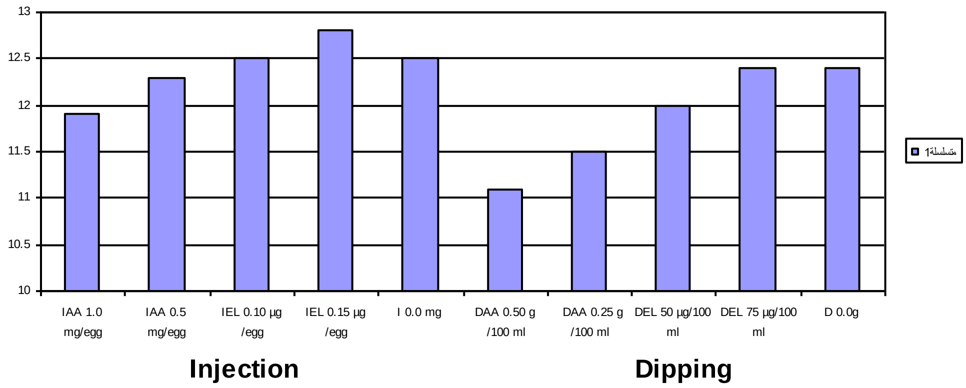


Figure (1)

Growth performance of produced chicks:

Body weight:

Data presented in table (2) show that dipping treatment produced heavier chicks not only at hatch, but also at all ages than those produced from injection treatment.

Also at hatch and all ages, chicks produced from eggs treated with 1.0 mg AA showed significantly (P<0.05) the heaviest weights, followed by those treated with the low level from AA (0.5 mg). While, both EL levels showed moderate values and those of control eggs showed the lightest weights.

Increasing level of AA in injection or dipping treatment resulted in body weight of chicks at hatch and all sampling ages to increase. However, the opposite was obtained with EL levels. Generally, chicks produced from eggs treated with both levels of AA or EL showed higher body weights than their controls at hatch and all ages, being the heaviest for chicks of eggs dipped in AA solution at a level of 0.50 g/100 ml (Fig. 2).

Table (2): Means and standard errors of body weight (g) as affected by technique, treatment and their interaction.

Variable	Body weight (g) at age successive (wk)			
	Hatch	4	8	12
Effect of technique:				
Injection (I)	35.3±0.01^{b}	301.4±0.01^{b}	782.9±0.01^{b}	1208.1±0.01$_{b}$
Dipping (D)	36.8±0.01^{a}	332.1±0.01^{a}	815.1±0.01^{a}	1270.7±0.01^{a}
Effect of treatment:				
AA (1.0 mg)	37.3±0.01^{a}	342.5±0.01^{a}	845.8±0.01^{a}	1306.1±0.01^{a}
AA (0.5 mg)	36.5±0.01^{b}	326.3±0.01^{b}	826.3±0.01^{b}	1262.9±0.01^{b}
EL (0.10 µg)	36.0±0.01^{c}	335.2±0.01^{a}	809.3±0.01^{c}	1258.7±0.01^{b}
EL (0.15 µg)	35.6±0.01^{c}	303.7±0.01^{c}	795.8±0.01^{c}	1223.7±0.01^{c}
Control (0.0g DW)	34.8±0.01^{d}	276.2±0.01^{d}	718.1±0.01^{d}	1145.8±0.01^{d}
Effect of interaction :	*	*	*	*

a,b,c… i: Means within the same column for each classification with different superscripts are significantly different (P<0.05)

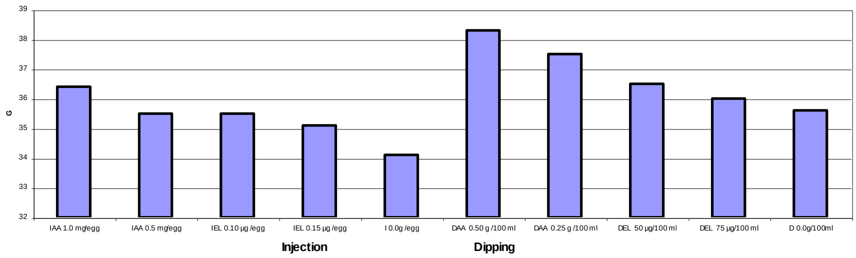
The improvement in body weight of chicks produced from eggs treated with both level from EL agreed with those obtained by Gomma (1990), who stated that when Hubbard broiler eggs injected with either 0.5 or 1.0 µg EL resulted in heavier body weight when compared with control.

On the other hand, the obtained results of dipping treatment with both levels of AA (0.25 or 0.50 g/100 ml) contrasted those reported by Shafey (2002), who found that eggs dipped in AA solution at levels of 20 or 30 g/l decreased weight of chicks at hatch. This difference may be attributed to strain variation or incubation conditions. Meanwhile the beneficial effect of AA acid on body weight of chicks was recorded recently by Mariey *et al*. (2004), who recorded the heaviest weights of chicks hatched from eggs of pullets fed diet containing 250 mg vitamin C.

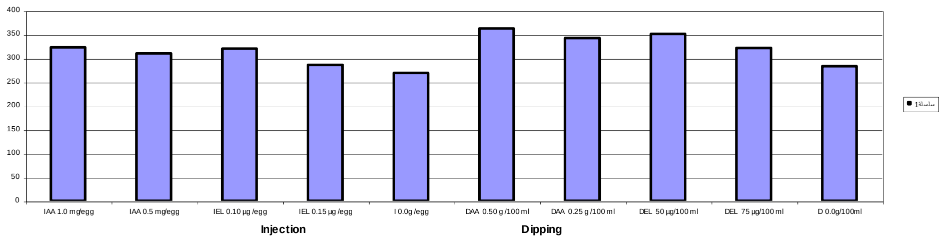
Body weight gain:

Data listed in table (3) indicated that chicks of dipping treatments had higher body weight gain at all age intervals than those of injected treatment. However, the differences were significant (P<0.05) at all age intervals, except at 4-8 weeks interval.

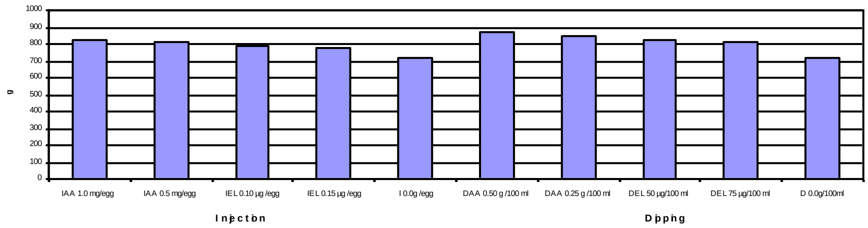
Body weight at hatch as effected by between treatment



Body weight at 4 weeks of age as effected between treatme



Body weight at 8 weeks of age as effected by between treatment



Body weight at 8 weeks of age as effected by between treatment

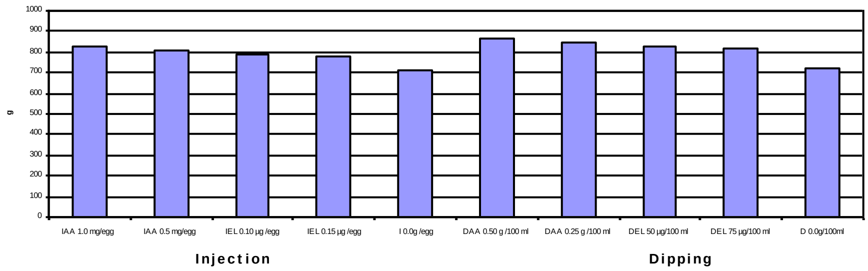


Figure (2)

Chicks hatched from eggs treated with 1.0 mg from AA showed the highest gain, followed by those produced from eggs treated with 0.5 mg AA and both EL, while the control chicks had the lowest gain. Also, the differences were significant (P<0.05) at all age intervals, except at 4-8 weeks interval.

Body weight gain of chicks at all age intervals increased by increasing level of AA in injection or dipping treatment of their eggs, while reversible situation was recorded with EL levels. In general, chicks of eggs treated with both levels of AA or EL showed higher body weight gain than their controls at all age intervals, being the heaviest for chicks of eggs dipped in AA solution at a level of 0.50 g/100 ml (Fig. 3).

Table (3): Means and standard errors of body weight gain (g) as affected by technique, treatment and their interaction.

Variable	Total weight gain (g) at age interval (wk)			
	0 - 4	4 - 8	8 - 12	0 - 12
Effect of technique:				
Injection (I)	266.1±0.01^{b}	481.5±0.03	425.2±0.01^{b}	1172.8±12.4^{b}
Dipping (D)	295.3±0.01^{a}	482.9±0.03	455.7±0.04^{a}	1233.9±12.4^{a}
Effect of treatment:				
AA (1.0 mg)	305.2±0.01^{a}	503.3 ± 0.04^{a}	460.3±0.01^{a}	1268.8±19.6^{a}
AA (0.5 mg)	289.8±0.01^{a}	499.8 ± 0.01^{a}	436.8±0.01^{c}	1226.4±19.6^{b}
EL (0.10 µg)	299.2±0.01^{b}	474.1 ± 0.04^{c}	449.4±0.01^{b}	1222.7±19.6^{b}
EL (0.15 µg)	268.1±0.01^{c}	492.1 ± 0.04^{b}	428.0±0.01^{d}	1188.2±19.6^{c}
Control (0.0g DW)	241.4±0.01^{d}	441.9 ± 0.01^{d}	427.7±0.01^{d}	944.3 ±19.6 ^{d}
Effect of interaction :				

a,b,c… h: Means within the same column for each classification with different superscripts are significantly different (P<0.05)

The obtained results concerning the effect of EL are in agreement with those reported by Majeed *et al*. (1984), who found that live body weight of chicks increased by thyroxin treatment from the 7th to 12th week of age when young chicken of an egg laying strain daily injected with 1, 2 µg thyroxin per 100 g body weight.

Growth rate:

Data presented in table (4) indicated that growth rate was affected significantly (P<0.05) by technique of treatment, being higher in chicks of eggs treated by dipping than injection at 0-4 and 8-12 wk intervals and the opposite was obtained at 4-8 wk interval. Such differences at different age intervals studied reflected in similarity growth rate of chicks of eggs treated with both techniques.

Growth rate of chicks was reversibly affected by AA or EL treatments as compared to the control. Growth rate was significantly (P<0.05) the highest for chicks of eggs treated with EL (0.10 µg) at 0-4 wk and control dipping at 4-8 and 8-12 wk intervals, respectively. However, on the overall means from 0-12 wk interval, AA at a high level (1.0 mg) showed the highest values. The opposite was observed at 4-8 and 8-12 intervals. While, chicks of eggs treated with EL showed moderate values at all age intervals (Table 4).

It is of interest to note that growth rate showed variable trends as affected by the interaction between techniques and treatments, being the highest for chicks of eggs dipped in 50 g EL/100 ml at 0-4 wk, for control injected eggs at 4-8 wk and for control dipped eggs at 8-12 wk. Overall for all age intervals, chicks of eggs injected with 1.0 mg/egg showed the highest growth rate (Fig. 4).

Body weight gain (g) at age interval 0 - 12 weeks of age as affected by interaction

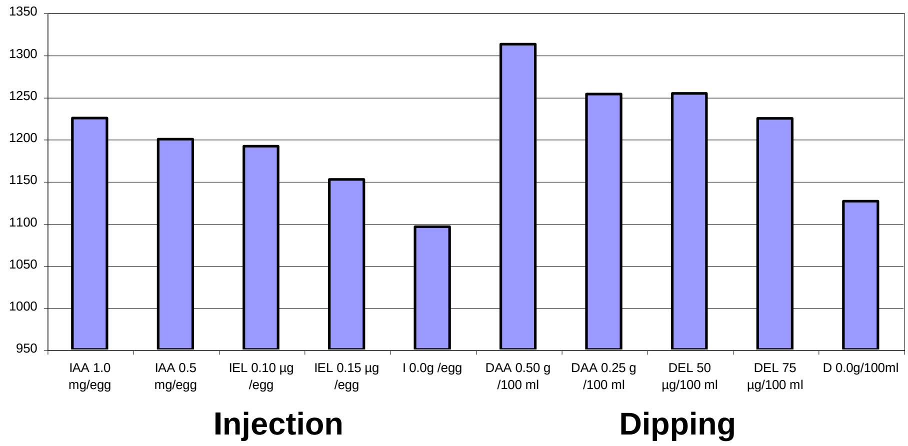


Figure (3)

Table (4): Means and standard errors of growth rate (%) as affected by technique, treatment and their interaction.

Variable	Growth rate (%) at age interval (wk)			
	0 - 4	**4 - 8**	**8 - 12**	**0 -12**
Effect of technique:				
Injection	157.9±0.1^{b}	87.4±0.2^{a}	42.7±0.2^{b}	188.8±0.2
Dipping	159.9±0.1^{a}	84.3±0.2^{b}	43.7±0.2^{a}	188.7±0.2
Effect of treatment:				
AA (1.0 mg)	160.6±0.1^{b}	84.8±0.3^{d}	42.8±0.2^{c}	189.6±0.2^{a}
AA (0.5 mg)	159.7±0.1^{c}	86.8±0.3^{b}	41.8±0.2^{e}	188.8±0.2^{b}
EL (0.10 µg)	161.2±0.1^{a}	83.0±0.3^{e}	43.4±0.2^{b}	189.0±0.2^{b}
EL (0.15 µg)	158.0±0.1^{d}	85.9±0.3^{c}	42.4±0.2^{cd}	188.7±0.2^{b}
ontrol (0.0g DW)	155.3±0.1^{e}	88.9±0.3^{a}	45.9±0.2^{a}	188.2±0.2^{c}
Effect of interaction:	*	*	*	*

a,b,c… h: Means within the same column for each classification with different superscripts are significantly different (P<0.05)

The remarkable decrease in growth rate of chicks of eggs treated with EL was associated with inducing hyper-thyrodism (Beaty *et al*. 1973), who observed that the rate of increment differed according to thyroid treatment.

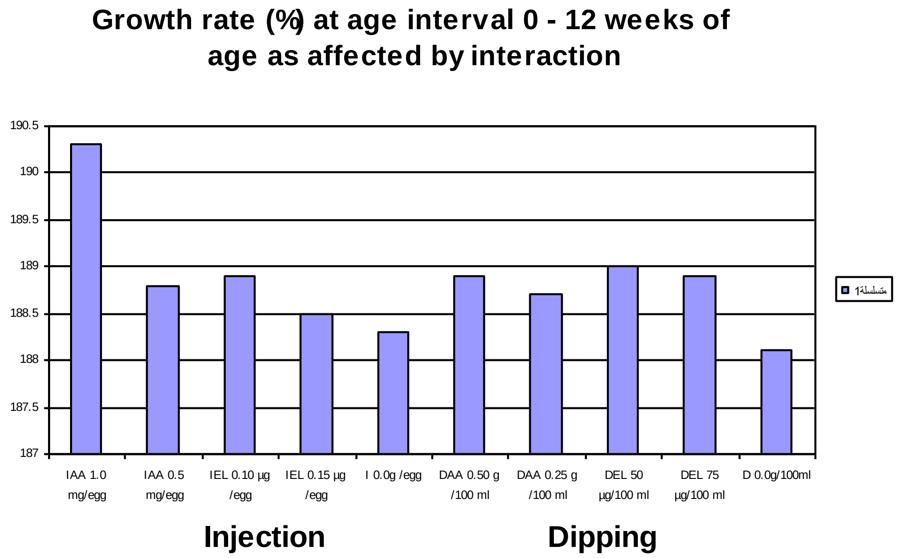


Figure (4)

Feed conversion:

Data presented in table (5) show that dipping significantly (P<0.05) improved feed conversion in comparing with injection technique at all age intervals studied.

At 0-4, 4-8 and 8-12 wk intervals, treatment with 1.0 mg AA obviously improved feed conversion of chicks, being significantly the best and followed by high level from EL treatment, while the control chicks significantly (P<0.05) showed the poorest feed conversion. During the whole period from 0-12 wk, feed conversion was the best in 1.0 mg AA as compared to the other treatments and the controls (Table 5).

Table (5): Means and standard errors of feed conversion (g feed/g weight) as affected by technique, treatment and their interaction.

Variable	Feed conversion (g feed/g weight) at age interval (wk)			
	0 – 4	4 - 8	8 - 12	0 - 12
Effect of technique:				
Injection	2.6± 0.01^{a}	2.8 ± 0.01^{a}	4.0 ± 0.01^{a}	3.2 ± 0.01^{a}
Dipping	2.4 ± 0.01^{b}	2.7 ± 0.01^{b}	3.7 ± 0.01^{b}	2.9 ± 0.01^{b}
Effect of treatment:				
AA (1.0 mg)	2.2 ± 0.01^{e}	2.7 ± 0.01^{c}	3.7 ± 0.01^{d}	2.9 ± 0.01^{d}
AA (0.5 mg)	2.4 ± 0.01^{c}	2.7 ± 0.01^{c}	3.9 ± 0.01^{b}	3.1 ± 0.01^{c}
EL (0.10 µg)	2.3 ± 0.01^{d}	2.8 ± 0.01^{b}	3.8 ± 0.01^{c}	3.1 ± 0.01^{c}
EL (0.15 µg)	2.6 ± 0.01^{b}	2.7 ± 0.01^{c}	4.0 ± 0.01^{a}	3.2 ± 0.01^{b}
Control (0.0g DW)	2.9 ± 0.01^{a}	3.0 ± 0.01^{a}	4.0 ± 0.01^{a}	3.3 ± 0.01^{a}
Effect of interaction				

a,b,c… g: Means within the same column for each classification with different superscripts are significantly different (P<0.05)

Chicks hatched from eggs dipped in 1.0 mg AA showed the best feed conversion at all age intervals compared with other treatments applied with both techniques (Fig. 5).

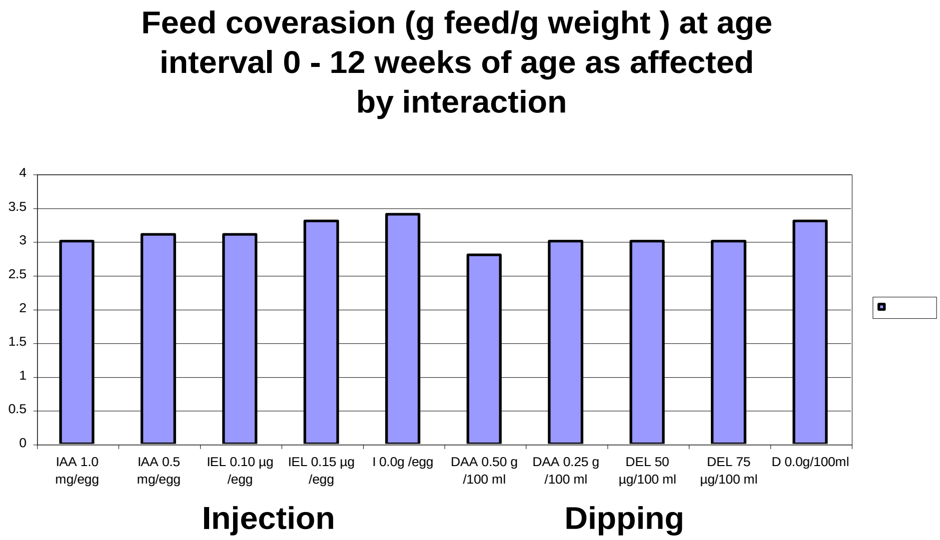


Figure (5)

Viability rate:

Results of viability rate cleared that chicks hatched from dipping had significantly (P<0.05) higher viability rate compared with those hatched from injection technique (Table 6).

The highest growth performance of chicks treated with 1.0 mg AA reflected their highest viability rate, followed by those treated with low AA level and both EL levels, and the lowest viability was observed for chicks of the control eggs (Table 6).

Table (6): Means and standard errors of viability rate (%) as affected by technique, treatment and their interaction.

Variable	Viability rat (%)
Effect of technique:	
Injection (I)	92.8 ± 0.2^{b}
Dipping (D)	93.8 ± 0.1^{a}
Effect of treatment:	
AA (1.0 mg)	94.5 ± 0.2^{a}
AA (0.5 mg)	93.7 ± 0.2^{b}
EL (0.10 µg)	93.4 ± 0.2^{b}
EL (0.15 µg)	92.6 ± 0.2^{c}
Control (0.0g DW)	92.3 ± 0.2^{c}
Effect of interaction :	

a, b, c and e: Means within the same column for each classification with different superscripts are significantly different (P<0.05)

Generally, the highest viability rate was recorded for chicks of eggs dipped in 1.0 mg AA solution (Fig. 6).

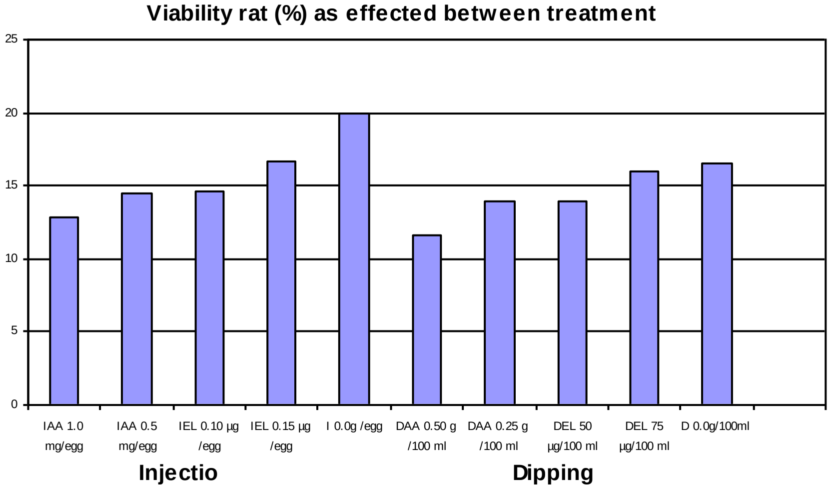


Figure (6)

Economic efficiency:

Results of economic efficiency for different treatments are shown in table (7). Results indicated that chicks of eggs injected with AA at a level of 1 mg/egg recorded the highest economic efficiency at hatch when compared with other treatments applied. However, hatched chicks of eggs dipped in AA solution at a concentration of 0.5% had the highest economic efficiency at the end of the experimental period.

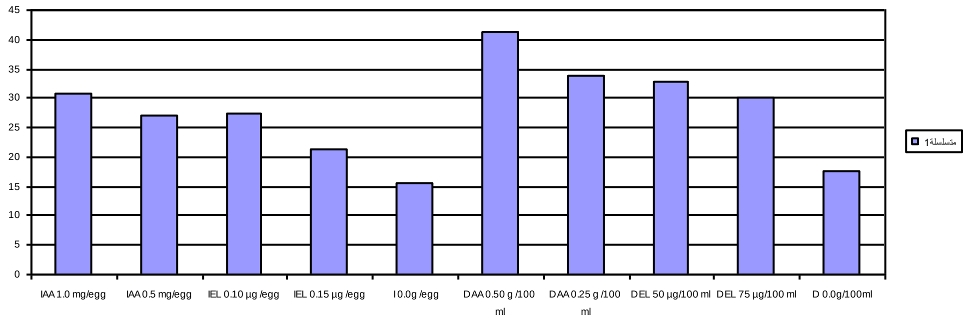
Table (7): Economic efficiency.

Trait / Treatment	Cost of (L E) treatment		Total cost	N	Income L E	Net income L E	E E %	Cost of (L E)			Income L E	Net income L E	E E %
	Treatment material	Incubation			Chicks	Chicks		Chick	Feed	Total	Chick		
I AA(1.0mg)	0.10	6.75	114.85	118	153.4	38.55	33.57	0.97	5.58	6.55	8.57	2.02	30.8
I AA(0.5mg)	0.05	6.75	114.80	115	149.5	34.70	30.23	1.00	5.61	6.61	8.40	1.79	27.1
I EL 0.10ug/egg	0.005	6.75	114.76	115	149.5	34.74	30.27	1.00	5.55	6.55	8.34	1.79	27.3
I EL0.15ug/egg	0.008	6.75	114.76	113	146.9	34.24	29.84	1.02	5.63	6.65	8.06	1.41	21.2
I 0.0g DW	0.000	6.75	114.75	108	140.4	25.65	22.35	1.06	5.58	6.64	7.67	1.03	15.5
D AA0.50g/100ml	2.00	6.75	116.75	119	154.7	37.95	32.51	0.98	5.53	6.51	9.19	2.68	41.2
D AA0.25g/100ml	1.00	6.75	115.75	116	150.8	35.05	30.28	1.00	5.55	6.55	8.77	2.22	33.9
D EL50ug/100ml	1.00	6.75	115.75	116	150.8	35.05	30.28	1.00	5.61	6.61	8.78	2.17	32.8
D EL75ug/100ml	1.50	6.75	116.25	113	146.9	35.15	28.02	1.03	5.56	6.59	8.58	1.99	30.2
D 0.0g DW	0.00	6.75	114.75	113	146.9	35.15	28.02	1.02	5.59	6.61	7.88	1.17	17.7

1- Number of eggs in each treatment was 135 2- N: Chicks number
3-Price of kg ascorbic acid 80.0 L.E
Price of 100 tablets of eltroxin (100 UG) 4.0 L.E
Price of egg 0.8 L.E **Price of chick 1.30 L.E**
Incubation price per 100 egg 5 L.E **Price of kg live body weight 7.0 L.E**

Based on previously mentioned results, it could be concluded that chicks hatched from eggs injected with 1 mg AA/egg or dipped in 0.5% AA solution seemed to be economically adequate for chicks to achieve the favorable growth and could be economic.

Economic efficiency as affected by interaction



Injection **Dipping**

Figure (7)

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تأثير هرمون الثيروكسين و فيتامين ج علىنسبة الفقس وحيوية الكتاكيت في الدجاج المحلى .

رمضان مغاورى محمود ، وجدي زكريا على و هشام رجب سمك
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أجري هذا البحث لدراسة تأثير حقن البيض أو غمره في مستويات مختلفة من حمض الأسكوربيك (فيتامين ج) والألتروكسين (هرمون الثيروكسين) على معدل الفقد من وزن البيضة ونسبة الفقس و النفوق الجنيني والأداء الإنتاجي للكتاكيت الفاقسة من المعاملات المختلفة.

- تفوقت معاملات الغمر معنويا في جميع الصفات المدروسة عن معاملات الحقن.
- سجلت معاملات فيتامين ج أعلى المعدلات معنويا في جميع الصفات المدروسة مقارنة بمعاملات هرمون الثيروكسين والماء المقطر.
- تفوقت معاملة الغمر في محلول فيتامين ج معنويا في نسبة الفقس كما انخفضت معدلات النفوق الجنيني معنويا.
- أظهرت الكتاكيت الفاقسة من معاملة الغمر في محلول فيتامين ج تفوقا معنويا في وزن الجسم إضافة إلى الزيادة المعنوية في الوزن المكتسب والحيوية وكفاءة تحويل الغذاء.
- تفوقت الكتاكيت الناتجة عن المعاملة بحقن البيض بفيتامين ج بمعدل ١ ملجم/بيضة معنويا في معدل سرعة النمو في نهاية فترة التجربة.

وقد خلصت الدراسة إلى أن معاملة البيض بالغمر في محلول فيتامين ج بتركيز ٥و% أدى معنويا إلى تحسن نسبة الفقس وانخفاض معدلات النفوق الجنيني كما أدى إلى زيادة وزن الجسم وارتفاع معدل الحيوية وكان الأفضل اقتصاديا عند باقي المعاملات .