Egypt. Poult. Sci. Vol (37)(III): (747-760)(2017) **(1737)**

Egyptian Poultry Science Journal

http://www.epsaegypt.com

ISSN: 1110-5623 (Print) – 2090-0570 (Online)

THE EFFECTS OF EARLY POST-HATCH NUTRITION ON BROILER PERFORMANCE

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Received: 11/06/2017 Accepted: 14/08/2017

ABSTRACT: The present study aimed to investigate the effect of early feeding in hatcher baskets and chick boxes with and without experimental materials on broiler growth performance, carcass traits, blood parameters and economical efficiency. A total number of 1980 eggs produced from Arber Acres plus (AA+) breed were incubated and randomly divided into equal 4 groups of nearly similar means of egg weight (EW) each with replicates for each treatment. Eggs were hatched in hatcher baskets with experimental materials. Only 420 day-old broilers male (AA+) chicks were divided into four feeding trials. The Experimental diets were distributed as following: control without feed at hatchery; boiled egg whites; (BEW), pieces of fruit orange (OF) and pre-starter diet (PS) were put at hatcher basket and chicks boxes. Live performance measurements for each feeding period were measured and/or calculated in terms of live body weight (LBW), body weight gain (BWG), feed intake (FI), feed conversion ratio (FCR), growth rate (GR), performance index (PI) and mortality rate. Also, European efficiency factor; carcass parameters, blood plasma constituents, and economical efficiency (EEf). Increasing body weight, feed intake due to early access to feed especially in OF and PS groups, meanwhile, BWG, FCR and GR for early feeding groups BWE, OF and PS were significantly improved compared to control. Performance Index and European efficiency factor were improved with early feed by OF and PS diets groups. Gastrointestinal tract length was increased by early feeding of OF and PS diets. Data indicated that chicks in OF and PS groups recorded the best values for dressing percentage , deboning ratio; thigh meat ratio and breast meat ratio compared to chick groups fed control or BEW at the end of experimental periods. Blood parameters as affected by EF using different experimental diets (OF, PS and BEW) showed higher values in experimental treatments than control. From economical point of view, it can be concluded that early feeding with OF and PS value for hatched chicks could be recommend for realizing best results of performance.

Key words: early feeding, broiler, growth performance, carcass

INTRODUCTION

The importance of early nutrition has already been extensively researched in recent years. A good-quality one day-old chick is a crucial link between the hatchery and the broiler farm (Willemsen et al., 2010). The delayed consumption of water and nutrients could lead to diminishing of their growth and weight. This is subjected by Roberson (2003) to deterioration effects on breast meat or broiler performance and other production parameters in the end of rearing period. Early nutritional strategies offer the promise of sustaining progress in production efficiency and welfare of commercial broiler chicken (Noy and Uni, 2010). Importance of early nutrition in practice, both chicks and poults hatch over a period of 24-48 hours and are held in the incubator until a large percentage of the birds have hatched. Hatchery treatments and transport to the farm involve a further holding period of up to 72 hours. Nitsan et al. (1991) reported that during this period, birds normally receive neither food nor water. Despite the contribution of residual yolk to the bird's energy balance, the newly hatched chicks have only a limited ability to assimilate food and water. Mobilization of body reserves, mainly from subcutaneous fat and liver and potentially from muscles, to support metabolism and maturation of the thermoregulatory system, a process that manifests mainly during the first ten days of the postnatal life (Nichelmann and Tzschentke, 2002). The review by Uni and Ferket (2004) gave an overview of the effect of a prolonged holding time after hatch on yolk utilization, growth and gastro-intestinal development, muscle development and immunological development. However, the effect of delay in feed access and hormones and metabolites as well as on development of homoeothermic has not been described in detail in literature yet. sweet oranges are valuable source of vitamin C as well as energy (Hasin et al. 2006, Yang et al. 2011). Vitamin C or polyphenols increased antioxidant enzymes in red blood cells (Dragsted et al. 2001). Incorporation in the ration of fast growing broiler chickens (for the first 3 days of age) on performances are scarce.

Chalghoumi *et al.* (2009). Therefore, the present study amid to investigate the effects of different dietary natural ingredients as an early feeding in hatchery, on subsequent chick's broilers performance, carcass traits, blood parameters as well as economical efficiency.

MATERIALS AND METHODS

The experimental work of the present study was carried out at Cairo-Miser Poultry Grand Parent (CMPG) Hatchery and Poultry Research & Production Unit, environmental Studies and Research Institute (ESRI), University of Sadat City, Egypt.

Experimental birds and diets

A total number of 1980 hatching eggs produced from Arber Acres plus breed were incubated in Chicks Master AVIDA hatcher at Cairo Poultry Company. Eggs were randomly divided into 4 equal groups of nearly similar means of egg weight (EW) average 63.5g in 3 replicates for each treatment. Eggs were hatched in hatcher baskets with experimental materials. The Experimental diets were distributed as following: control without feed at hatchery; boiled egg whites without yolk (BEW), pieces of fruit orange without peel (OF) and pre-starter diet (PS)

were put at hatcher basket and chicks boxes.

1- Control without feed at hatchery (3 pens ×35 chicks).

2- Early access feed with boiled egg whites (BEW) at hatcher basket and chicks boxes (3 pens ×35 chicks). Eggs rejected after receiving hatching eggs from breeders flocks.

3- Early access feed with pieces of fruit orange (OF) at hatcher basket and chicks boxes (3 pens ×35 chicks).

4- Early access feed (pre-starter diet with PE at hatcher basket and chicks boxes (3 pens ×35 chicks).

Only 420 out of 1414 day-old broilers male (AA+) chicks were divided into four feeding trials. Chicks were individually wing banded. Chicks were stayed 12 hours after hatch in carton chick boxes with the same conditions and transported to the broiler farm within 30 min. Chicks were divided into experimental groups, so that each groups had approximately similar initial weight (44.3g). Floor pens with chopped wheat straw litter and fed a commercial corn-soybean meal diet containing (Pre-Starter diet) 24.7% CP and. 2938.6 kcal ME/kg diet for the first 3 days post hatching then weighed, then housed in separated pens provided with a manual feeders and manual drinkers. Chicks were kept as possible under similar managerial and hygienic conditions. Artificial lighting was provided continuously at night. Fresh clean tap drinking water was freely available. Diets were formulated to cover all recommended nutrient requirements.

Individual live body weight (LBW) for each chick was recorded to the nearest g at 0, 2, and36 days.

body weight gain (BWG), feed intake (FI), feed conversion ratio (FCR), growth rate (GR), mortality rate and performance index (PI) recorded according to North (1984) . At the end of experimental period (36 d), 3 birds were randomly chosen from each treatment alone for slaughtering. Liver and heart were accurately weighed and proportionated to the LBW. The right side of each carcass was halved into the fore-quarter (FQ) and hind-quarter (HQ) each quarter was weighed and then dissected into bone and meat and each of them was weighed to calculate their percentages out of each quarter and the whole carcass. Blood samples were immediately taken during slaughtering into collecting heparinized tubes. Plasma were individually separated by centrifugation at 3000 rpm for 15 minutes, transferred into a clean Ependorf vials and stored in a deep freezer at approximately -20 ˚C for later analysis. Total protein (TP, g/dl), albumin (Alb, g/dl), triglyceride (TG, mg/dl) , total antioxidant capacity (TAC mɱ/L) and Globulin (Gl, g/dl) were detected. To determine the economical efficiency (EEf) of the diets for meat production, the management factors in all dietary treatments were stabilized. The price of the experimental diets was calculated of the local market at the time of the study. So, the cost of feed consumed for each treatment was calculated. The EEf was calculated as the feed cost needed to obtain one kilogram of LBWG according to Bayoumi, (1980).

Statistical analyses:

The experiment was arranged in a complete randomized design. Then 1-way ANOVA was employed using the general linear model (GLM) procedures according to SAS (2009). The differences among groups were evaluated by Duncan's (Duncan's, 1955)

multiple comparison tests. Differences were considered statistically significant at ($P \leq 0.05$). Statistical analysis of traits presented as percentages was carried out for arcsine values of their estimates. All obtained data were analyzed using the following model.

$Y_{ij} = \mu + Ti + Eij$

Where:

Yij = the individual observation.

μ = the overall mean.

Ti = treatment effect.

Eij = the experimental error.

RESULTS AND DISCUSSION

Growth performance

Results of growth performance parameters of broiler chicks as affected by early feeding using different experimental diets control, BEW, OF and PS at 2 and 36 days of age are presented in Table 3. Data indicated that chicks group fed early with PS at 2 days had the best LBW value. Meanwhile, control chicks group recorded the worst LBW value. There is insignificant difference between chicks that fed early with BEW or OF and PS at 2 days ages. Body weight gain of broiler chicks for treatments of BEW, OF, PS was significantly ($p<0.05$) increased as compared to that of the control group during total period (0-36 days) and this is may be due to early feed availability in hatchery and chick boxes. Also, these could be related to higher feed intake in these groups. This conclusion is in agreement with those reported by Chalghoumi et al. (2009) and Mahdavi et al. (2010) who concluded that the incorporation of dried egg yolk in the alimentation of broiler chickens improves significantly the growth performance. More recently, Rizk and Ibrahim (2014) reported that body weight for early feeding group was significant heavier than late feeding group.

Feed intake and feed conversion

Data of FI and FC are presented in Table3 . There were significant differences between BEW and PS groups compared to control with respect to total feed intake. Similarly , Rizk and Ibrahim (2014)observed that feed consumption of early feeding was significantly increased by about 8.7% more than those for late feeding during the overall period 0-4wks. Also, Molenar et al.(2009) found that high protein levels in combination with low energy levels in the diet showed a positive effect on post-hatch growth.

Experimental group of OF represented significant ($P<0.05$) improvements in FCR values by increasing age and recorded significantly ($P<0.05$) the best FCR value for total period (0- 36 days). Insignificant difference was detected between BEW and OF groups with respect to FCR. This conclusion could be due to the fact that proteins of egg white are badly digested and assimilated in the first 72 hours post-hatching. In agreement with these results, the gastrointestinal tract continues developing and undergoes morphological and physiological changes that improve digestion and absorption of food (Maiorka et al., 2003 and Maiorka et al., 2006). Rizk and Ibrahim (2014) reported that live weight and feed intake as well as weight gain and feed conversion ratio were significantly improved by early feeding as compared to late feeding. Chicks group fed PS represented significant increase of GR compared to control one, where as, there were no significant difference among the supplemental diet groups . These results could be due to early feeding in hatchery and chick boxes, different previous

researches supported this note (Noy and Sklan, 1999; Batal and Parsons 2002).

Results of PI % as affected by EF using different experimental diets are presented in Table3.Data revealed that PI was increased (P<0.05) for all supplemented groups compared with control group. With these regards, Ali et al.(2012) reported that the results of broilers index productions were significantly declined by fasting treatments rather than others at 21 and 42 days at age.

Morever, significant differences (P<0.05) were observed on MR among the experimental groups of early fed compared to control, besides the worst mortality % was observed in BEW group chicks. Meanwhile, the groups of PS and OF recorded moderate mortality compared to the control group. These observations did not agree with those reported by Noy and Sklan (1999) who showed that early feeding reduced mortality numerically.

Carcass Characteristics.

Dressing percent, liver and heart ratios were significantly improved for chicks subjected to OF and PS supplementation compared to those for BEW and control groups (Table 4). These results are in agreement with those obtained by El - Husseiny et al. (2008) who observed that chicks fed control diet (23% CP) for 48 hours or 7 days recorded significantly (p< 0.01) the highest internal organs compared with the other treatments. Also they indicated that early access to feed stimulates the growth of internal organs.

Results cleared that GIT (crops+ small intestine + large intestine) of chicks at five weeks of age in OF and PS groups was significantly improved and developed more than chicks groups fed control and BEW. These may be due to early feed access contained all nutrients that makes chickens well adapted to diets by increasing the volume of the digestive tract and digestive enzymes secretion. This improvement could be explained in the light of what previously mentioned by Nitsan el al.(1991) who reported that nutrients from the yolk are used in development of the GIT of the embryo and the yolk sac provides 50% of the chick's energy on the first days being only about 2% this may be explained why the chicks fed early have higher organs and development of the GIT than the fasting chicks. El Rammouz et al. (2011) reported that early feed is important for the development of the digestive and the immune system. These results revealed that chick groups early fed OF and PS had improved and development of birds digestive tract that enhance digestibility and live body weight gain compared with other experimental groups for its environmental conditions . These results support the previous work obtained by Speake et al. (1998) detected that early feed stimulate the development of the gastrointestinal tract (crop, small and large intestine). Also, Uni et al.(1999) who cleared that early feeding of chicks and poults compared with fasted chicks and poults has resulted in improved intestinal mucosal function increased gut associated lymphoid tissue. Similarly, Ganjali et al. (2015) detected that the highest small intestine relative weight and length were observed in birds that started to feed at 6h after hatching and the lowest weights were observed in birds that started to feed at 18h after hatching.

Results of breast meat and deboning ratio are represented in Table 4. There were significant differences (p< 0.05) among treatments, the best value recorded with OF treatment. That is in agreement with Schvazad et al.(2007) who reported that

immediate access to feed improved breast meat yield.

However, Thigh meat improved significantly ($p<0.05$) of the experimental group OF and control compared to BEW and PS treatments.

Blood parameters.

Results of blood parameters at 36 days of age as affected by early feeding using different experimental diets are presented in Table 5 .Data showed insignificant difference within all experimental early feed diets in the TP, TG, GL, and AL. Chicks group fed OF significantly ($P>0.05$) recorded the highest value of TAC compared to control, while there were no significant differences with the other chick group of BEW and PS diet. This result may be attributed to the role of ascorbic acid, essential oils and other carotenoids found in OF for increasing blood antioxidants .In this concern ، Ascorbic Acid (AA) as an anti-stress agent is the most important vitamin (Brake and Pardue,(1998) .Also, Rizk and Ibrahim (2014) concluded that early feeding resulted in a significant improvement in serum proteins level comparing to late feeding and recorded improvement in injection groups by nutritive solutions comparing to the control.

Economical Efficiency

Results of economical efficiency as affected by early feeding using different experimental diets are presented in Table 6. Results showed an improvement in the average values of net revenue, economic efficiency, and relative economic efficiency due to early feeding of broiler diets with BEW, OF and PS compared to control group. Also, chicks that early fed with OF and PS recorded the highest value of economic efficiency and relative economic efficiency, followed by broiler early fed with BEW. These results are in agreements with those obtained by Oyewole et al. (2013) who reported that the inclusion of fermented orange sweet fruit peel meal (SOFPM) in the diets of growers resulted in gradual reduction in feed cost/25 kg, feed cost/bird and cost of production of growers at the expense of body growth. Based on the findings in this study, it is recommended that poultry farmers may substitute dietary maize with (SOFPM) fermented for 24 hours in growing pullet diets not more than 10% for optimum performance.

CONCLUSIONS

This study demonstrated that early feeding with OF and PS diets resulted in considerable growth performance benefits, improved gastrointestinal tract and stimulates carcass traits compared to chick groups fed control or BWE. Also, early feeding with OF and PS recorded the highest value of economic efficiency and relative economic efficiency % and improved performance followed by broiler early fed with BWE. Therefore, Placing feed in the hatcher baskets or transportation boxes has great benefits for broilers performance.

Table (1): Proximate analysis of Orange fruit (Citrus sinensis) Meal, OFM (Fresh and Peel) compared to Maize on DM% basis.

Nutrient	**Orange fruit meal[1]**	**Sweet Orange peel meal [2]**	**Maize[3]**
Dry matter %,	24.70	89.65	86.00
Crude protein%,	5.26	10.73	9.00
Crude fiber%,	18.22	7.86	2.70
Ether extract%,	1.22	12.60	4.00
Ash %,	12.55	11.90	1.30
NFE%	62.75	56.91	83.00
ME (Kcal/kg)	2650	3988.70	3432.00

OFM[1]: Agu et al. (2010) SOPM[2]: Sweet Orange peel meal, Maize[3]: According to Aduku (1993).

Table (2): Composition and calculated analysis of experimental diets

Ingredient, % as fed-basis	Pre-Starter diet (1-3 days)	Starter diet (4-14 days)	Grower diet (15-28) days	Finisher diet (29-36) days
Yellow corn,	52.59	54	62	56.0
Soybean meal(46 %CP),	32.00	26	22	16.8
Wheat bran	2.00	4.7	1.5	15.8
Corn Gluten meal (60%CP),	9.0	10.1	8.8	5.00
Vegetable oil	1.07	2.1	2.0	5.07
Monocalcium phosphate,	0.50	0.40	0.5	0.5
Sodium chloride,	0.30	0.30	0.30	0.30
Vitamin-mineral premix[1],	0.30	0.30	0.30	0.30
DL-Methionine,	0.17	0.40	0.4	0.01
L-Lysine,	0.14	0.40	0.8	0.02
Limestone ,	1.93	1.30	1.4	0.2
Total	100	100	100	100
Calculated analysis[2]				
Crude protein	24.7	23	20.2	17.08
ME, (KCal/kg)	2938.6	3000	3070	3111.3
Crude Fat %	2.05	2.85	2.99	3.19
Ca, %	0.997	1.003	3.2	0.887
P	0.50	0.47	0.42	0.41
Lys, %	1.986	1.00	0.91	0.813
Met, %	0.607	0.460	0.58	0.347

Vitamin[1]-mineral premix1: (Vit. & Min.) Was added at a rate of 3 kg per ton of diet and supplied the following per kg of diet (as mg or I.U. per kg of diet): Vit. A 12000 I.U., Vit. D3 2000 I.U., Vit. E 40 mg, Vit. K3 4 mg, Vit. B1 3 mg, Vit. B2 6 mg, Vit. B6 4 mg, Vit. B12 0.03 mg, Niacin 30 mg, Biotin 0.08 mg, Pantothenic acid 12 mg, Folic acid 1.5 mg, chloride 700 mg, Mn 80 mg, Cu 10 mg, Se. 0.2 mg, I 0.4 mg, Fe 40 mg, Zn 70 mg and Co 0.25mg.
[2]Calcaulated according to NRC (1994).

Table (3): Growth performance as affected by early feeding

Items	**Treatment**				**Sig**
	Control	**Boiled egg white**	**Orange fruit**	**Pre-starter diet**	**treatment**
		BEW	**OF**	**PS**	
Initial body weight(g)	44.2	44.7	44.1	44.4	
body weight at 2 days(g)	$71.7^{b}\pm0.47$	$^{ab}\pm0.51$ 72.2	$72.98^{ab}\pm0.52$	$73.7^{a}\pm0.58$	*
finalbodyweight(g)	$2241.2^{b}\pm22.5$	$2379.1^{a}\pm33.8$	$2380.7^{a}\pm32.0$	$2400.4^{a}\pm34.3$	*
Body weightgain(g) 36 days-0	$2197.4^{b}\pm30.22$	$2334.9^{a}\pm33.7$	$2336.2^{a}\pm31.8$	$2356.1^{a}\pm34.3$	*
Feed intake(g) days 36-0	$3505.4^{c}\pm53.56$	$3649.5^{b}\pm50.9$	$3610.3^{bc}\pm32.1$	$3735.1^{a}\pm13.4$	*
Feed conversion days 36-0	$1.660^{a}\pm 0.02$	$1.617^{ab}\pm0.03$	$1.571^{b}\pm 0.02$	$1.601^{ab}\pm0.03$	*
Growth rate days 36-0	$192.2^{b}\pm0.12$	$192.6^{ab}\pm0.13$	$192.6^{ab}\pm0.10$	$192.7^{a}\pm0.13$	*
Performance index	$137.3^{b}\pm3.67$	$149.8^{a}\pm4.10$	$155.2^{a}\pm4.40$	$152.0^{a}\pm4.3$	*
Mortality rate	$7.80^{d}\pm0.30$	$15.03^{a}\pm0.07$	$10.1^{c}\pm0.30$	$11.67^{b}\pm0.20$	*

.*- a, b, c and d: Means in the same row with different letters, differ significantly ($P<0.05$).

Table (4): Carcass characters as affected by early feeding

Items	Treatment				Sig
	Control	Boiled egg white	Orange fruit	Pre-starter diet	treatment
		BEW	OF	PS	
Dressing percent	67.15^{b}±0.38	67.07^{b}±0.57	68.64^{a}±0.19	67.84^{a}±0.22	*
Liver%	2.23 ± 0.03^{b}	2.25± 0.01^{b}	2.61±0.01^{a}	2.64^{a}± 0.01	*
Heart%	0.51± 0.07^{b}	0.49± 0.02^{b}	0.64±0.02^{a}	0.68^{a}± 0.02	*
Gastrointestinal tract length(cm)	301± 5.19^{b}	299 ± 0.01^{b}	326±3.78^{a}	333^{a}± 4.48	*
Deboning Ratio	48.10^{c}±0.06	47.42^{d}±0.06	51.88^{a}±0.05	50.40^{b}±0.06	*
Thigh meat%	18.54^{a}±0.12	17.40^{b}± 0.20	18.60^{a}±0.14	17.69^{b}±0.17	*
Breast meat%	23.8^{d} ± 0.09	24.1^{c}± 0.01	27.66^{a}±0.05	27.1^{b}± 0.90	*

-*.a, b, c and d: Means in the same row with different letters, differ significantly (P>0.05).

Table (5): Blood parameters of broiler chicks affected by early feeding

Item	Treatments				Sig
	Control	Boiled egg white	Orange fruit	Pre-starter diet	
		BEW	OF	PS	
Total protein(g/dl)	4.67± 0.01	5.01±0.36	4.92±0.22	4.30± 0.40	NS
Triglyceride(mg/dl)	64.13± 2.05	61.43±6.97	65.85±3.49	60.34± 3.31	NS
Albumin(g/dl)	2.38±0.12	2.79±0.29	2.28± 0.13	2.27±0.25	NS
Globulin(g/dl)	2.29±0.13	2.22± 0.34	2.63± 0.09	2.03± 0.41	NS
TAC ml/l	0.84^{b}± 0.12	1.17^{ab}±0.16	1.42^{a}±0.23	0.93^{ab}± 0.09	*

.*- a, b, c and d: Means in the same row with different letters, differ significantly (P<0.05).

Table (6): Economic Efficiency affected by early feeding.

Items	**Control**	**Boiled egg white**	**Orange fruit**	**Pre-starter diet**
		BEW	**OF**	**PS**
Price/ kg feed. (L.E)*	4.30	4.30	4.30	4.30
Total feed cost. (L.E.)	15.45	15.39	13.98	15.59
Final body weight (g)	2241.2	2379.11	2380.78	2400.40
Price / kg body weight (L.E.)**	18.5	18.5	18.5	18.5
Total revenue. (L.E.)	41.46	44.0	44.16	44.29
[1]Net revenue. (L.E.)	25.91	27.9	28.51	28.21
[2]Economic efficiency	1.66	1.73	1.82	1.75
Relative economic efficiency	100	104	110	105

*According to the price of different ingredients available in the market (May 2016).
** According to the local market price (May 2016).
[1]Net revenue= revenue from gain – feed cost.
[2]Economic efficiency = (net revenue / feed cost)*100.

REFERENCES

Ali A. S., Ali, A. T., Ahmad Ahmadi, Masoume Abasinezhad and Mohamad Kazemifard 2012. Broiler chickens performance in response to early feeding. African Journal of Agricultural Research Vol. 7(8), pp. 1296-1301.

Aduku, AO, 1993. Tropical Feedstuff-Analysis Table. Department of Animal Science, Faculty of Agriculture. Ahmadu Bello University, Samaru, Zaria, Nigeria. Pp 1-2.

Agu P.N., O.I. A. Oluremi and C.D.Tuleun 2010. Nutritional evaluation of sweet orange (citrus sinensis) fruit peel as a feed resource broiler production. International Journal of poultry science 9 (7):684-688, 2010.

Batal, A. and C. Parsons 2002. Effect of fasting versus feeding oasis after hatching on nutrient utilization in chicks. Poultry Science, 81(6), 853-859.

Brake, J. and S. L. Pardue 1998. Role of ascorbic acid in poultry nutrition. Proc. 10thEuropean Poultry Conference.pp. 63-67.

Bayoumi S. B. 1980. Effect of different rations on egg production for breeding hens. MSc. Thesis, Faculty of Agriculture. Kafr- El Sheikh, Tant Univeristy, Egypt.

Chalghoumi, R., C. Marcq, A. Thewis, D. Portetelle and Y. Beckers 2009. Effects of feed supplementation with specific hen egg yolk antibody (IgY) on salmonella species cecal colonization and growth performances of challenged broiler chickens. Poultry Science, 88: 2081-2092.

Dragsted LO, Young JF, Loft S, Sandstrom B, Nesaretnam K, Packer L 2001. Biomarkers of oxidative stress and of antioxidative defense: relationship to intervention with antioxidant-rich foods. Molecular Biological Mechanisms, Danish Food Administration, Søborg, Denmark, 272-278

Duncan, D.B. 1955. Multiple range and multiple F tests. Biometrics, 11:1-42.

El Rammouz R., S. Said, M. Abboud, S. Yammine and B. Jammal 2011. Effect of post-hatch early feeding times starter supplemented with egg yolk and white of boiled chicken eggs (Rhod Island Red) on growth performance, Australian Journal of Basic and Applied Sciences, 5(6): 660-671.

El-Husseiny, O. M., S. H. Abou El-Wafa and M. A. El-Komy 2008. Influence of fasting or early feeding on broiler performance. International Journal of Poultry Science, 7(3), 263-271.

Ganjali, H., A. R. Raji., and H. Zarghi 2015. Effect of post hatch delayed access to feed on performance, GIT physical and histological development and yolk absorption in young broiler chicks. Biomedical Pharmacology Journal, 8(2):945-955.

Hasin BM, Ferdaus AJM, Islam MA, Uddin MJ, Islam MS (2006) Marigold and orange skin as egg yolk color promoting agents. Int J Poult Sci 5, 979-987

Mahdavi, A.H., H.R. Rahmani, N. Nili, A.H. Samie, S. Soleimanian-Zad and R. jahanian 2010. Effects of dietary egg yolk antibody powder on growth performance. Journal of Poultry Science 89: 484-494.

Maiorka, A., E. Santin, F. Dahlke, I. C. Boleli, R. L. Furlan, and M.Macari 2003. Post hatching water and feed deprivation affect the gastrointestinal

tract and intestinal mucosa development of broiler chicks. Journal of Applied Poultry Research, 12 (4), 483-492.

Maiorka, A., F. Dahlke and M.S.F.A. Morgulis 2006. Broiler adaptation to post-hatching period. Ciênca rural, 36: 701-708.

Molenar, R., I.A.M. Reijrink, R. Meijerhof, J.K.W.M. Sparla and P.J.A. Wijtten 2009. Effect of protein and energy level in feed on post hatch chick performance. Animal Production Science 56(11) 1857-1866

Nichelmann, M. and B. Tzschentke 2002. Ontogeny of thermoregulation in precocialbirds.ComparativeBiochemistry and Physiology Part A 131: 751-763.

Nitsan Z., G. Ben-Avraham Z. Zoref and I. Nir 1991. Growth and development of the digestive organs and some enzymes in broiler chicks after hatching. British Poultry Science 32: 515-523.

North, M.O. 1984. Commercial Chicken Production Manual.3rd Ed. the AVI Publishing Co. Inc. West-port, Connecticut, U.S.A.

Noy, Y., and D. Sklan 1999. Energy utilization in newly hatched chicks. Poultry Science, 78(12), 1750-1756.

Noy, Y., and Z. Uni 2010. Early nutritional strategies. World's Poultry Science Journal, 66(4), 639-646.

NRC. Nutrient Research Council, 1994 Nutrient requirements of poultry. Nutrient Requirements of Domestic Animals. 9th ed. National Academy Press; Washington, DC, USA

Oyewole BO, OIA Oluremi, SO Aribido and JA Ayoade 2013. Productive and hematological performance of growing pullets fed fermented sweet orange (Citrus sinensis) fruit peel meal based diets. Inter J Agri Biosci, 2(2): 68-71.

Rizk Y.S. and A.F. Ibrahim 2014. Effect of in ovo injection by nutritive solutions and post hatch early feeding on hatchability, growth performance and physiological response of local strain chicks. Egypt. Poult. Sci. Vol (34) (IV): (993-1018)

Roberson K. 2003. Early Post- hatch Nutrition for Poultry. Pages 20-22 In Proc. Mult-State Poultry. Meeting.

SAS 2009. User's guide. 11th ed., SAS Inst. Inc., Cary, NC, USA.

Shivazad M, M. Bejaei, R. Taherkhani , M. Zaghari and MM. Kiaei 2007. Effects of glucose injection and feeding oasis on broiler chick's subsequent performance. Pakistan Journal of Biological Sciences, 10(11):1860-1864.

Speake, B.K., R. Noble and A. Murray 1998. The utilization of yolk lipids by the chick embryo. World's Poultry Science. J., 54: 319-334.

Uni, Z., and R. P.Ferket 2004. Methods for early nutrition and their potential. World's Poultry Science Journal, 60(1), 101-111.

Uni Z.; Y. Noy and D. Sklan1999. Post hatch Development of Small Intestinal Function in the Poultry. Poultry Science 78:215-222.

Willemsen H.;M. Debonne; Q. Swennen;N. Everaert;C. Careghi; H. HAN; V. Bruggeman; K. Tona and E. Decuypere 2010. Delay in feed access and spread of hatch: importance of early nutrition. World's Poultry Science. J., Vol. 66.

Yang XY, Xie JX, Wang FF, Zhong J, Liu YZ, Li GH, Peng SA 2011. Comparison of ascorbate metabolism in fruits of two citrus species with obvious difference in ascorbate content in pulp. J Plant Physiol 168, 2196-2205

الملخص العربى

تأثير التغذية المبكرة داخل معامل التفريخ على الأداء الإنتاجي في بداري التسمين

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تضمنت هذه الدراسة تجربة لبحث تأثير التغذية المبكرة بالمفقس على أداء النمو وتطور القناة الهضمية وصفات الذبيحة وبعض مكونات الدم في سلالة الاربرايكرز بلس ذكور.

حيث تم تقسيم بيض التجربة على عمر 18 يوم داخل المفقسات إلى 4 مجاميع المجموعة الأولى كنترول بدون أي إضافات والمجموعة الثانية تم إضافة بياض البيض المغلي في صواني الفقس وصناديق النقل و المجموعة الثالثة تم إضافة قطع البرتقال في صواني الفقس وصناديق النقل والمجموعة الرابعة تم إضافة عليقة سوبر بادئ تسمين في صواني الفقس وصناديق النقل .

ويمكن تلخيص أهم النتائج التي تم التوصل إليها فيما يلي:

1- تحسن معنوي في وزن الجسم وكمية العلف المأكول لكل كتكوت للمجموعات المغذاة على البيض المسلوق، وقطع البرتقال وعليقة سوبر بادئ تسمين.
2- تحسن معنوي في الزيادة لوزن الجسم، معدل التحويل الغذائي ومعدل النمو بالتغية المبكرة على بياض البيض المسلوق، وقطع البرتقال وعليقة سوبر بادئ تسمين عن مجموعة المقارنة خلال فترة التجربة .
3- تحسن عامل الكفاءة الاوروبى ودليل النمو للتغذية المبكرة على قطع البرتقال و عليقة سوبر بادئ تسمين.
4- التغذية المبكرة على قطع البرتقال و عليقة سوبر بادئ تسمين سجلت أعلى قيم في وزن الذبيحة وكذلك وزن الكبد ، القلب ولحم الصدر عن مجموعة المقارنة أو مجموعة بياض البيض المسلوق
5- حدوث تطور ملحوظ في أطوال القناة الهضمية في حالة التغذية المبكرة على قطع البرتقال و عليقة سوبر بادئ تسمين.
6- قياسات الدم سجلت أعلى قيم للمعاملات التجريبية قطع البرتقال، عليقة سوبر بادئ تسمين وبياض البيض المسلوق عن مجموعة المقارنة.
7- من النتائج السابقة يتضح انه يمكن ادراك أن التغذية المبكرة على قطع البرتقال ,عليقة سوبر بادئ تسمين تعطى أفضل نتائج نمو.

و بذلك هذه الدراسة توصي تحت الظروف العملية بتوفير المواد الغذائية أو العلف داخل صواني الفقس أو صناديق النقل أو سرعة فرز و نقل الكتاكيت الى المزرعة و توفير العلف مباشرة و ذلك لما لهذه العملية من فوائد كبيرة على أداء كتاكيت التسمين .