EFFECTS OF FASTING PERIOD AND ENZYME SUPPLEMENTATION ON PERFORMANCE AND SOME PHYSIOLOGICAL RESPONSES OF BROILER CHICKENS

By

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Abstract: *This study was conducted to evaluate the effect of fasting period with or without enzyme supplementation on body weight, body weight gain, feed intake, and feed conversion ratio; carcass traits and blood parameters of broilers. One hundred sixty eight, one day old, Cobb broiler chicks were randomly distributed into eight treatments. Each treatment included three replicates each with 7 birds. Birds were distributed into two basal diet groups. The first diet group was subdivided into 4 treatments (T1, T2, T3, and T4) which were supplemented with enzymatic growth promoters VETA –ZYME PLUS A 250 g/ton. The second diet group was also subdivided into 4 treatment groups (T5, T6, T7 and T8) without supplementation. In the first or the second group, the feed was offered to the birds as following: T1, T5: birds were fed ad libitum, T2 and T6 (feed removed from 12:00 to 18:00 am during a day), T3 and T7 (feed removed from 23.00 to 7:00 during a day) and T4 and T8 (removed feed from 23:00 to 9:00 during a day). The results indicated that feed restriction systems with or without enzyme supplementation did significantly affect feed intake, live body weight, body weight gain, and feed conversion at starter, grower and whole periods. Feed restriction did not significantly affected carcass traits and blood parameters during the whole periods.*

Key Words: Broilers, fasting period, Enzyme, blood, and carcass.

INTRODUCTION

Feeding strategy in broiler chickens, turkeys and rabbits should be result in high growth performance and improve feed conversion ratio. Early-life fast growth rate is accompanied by a number of problems, namely increased body fat deposition, high incidence of metabolic disorders, high mortality, and high incidence of skeletal diseases. To tackle with these problems early nutrient restriction programmes were used (Lipens et al., 2000; Mazzuco et al., 2000; Lee and Leeson, 2001). Limiting feed intake depresses growth during the period of restriction, but educed growth can be later compensated by re- alimentation (Govaerts et al, 2000).

Currently, probiotics have been used as a feed supplement in diets of different classes of poultry to enhance productive performance and immune responses (Higgins et al., 2008). In this regard, probiotics supplementation to broiler diets had positive effects on body weight gain, feed conversion ratio, and mortality rate in broiler chickens (Anjum et al., 2005).

Probiotics can also benefit the host animal by enhancing the synthesis of certain vitamins, providing digestive enzymes and increasing the production of volatile fatty acids that finally are metabolized in favor of the host (Fuller, 2001). They may also increase the uptake of nutrients from gastrointestinal tract through their indirect effect on its permeability Higgins et al. (2008).

An alternative to intensify poultry production is the use of enzymes or probiotics as feed additives to improve broilers performance in environmentally controlled houses. According to European legislation (2006), using of all antibiotic growth promoters (AGP) is forbidden in feed. During the past few years numerous trials have been conducted to compare the incorporation of mannan-oligosaccharides and direct feed microbial in the diets, versus conventional AGP (Markovicva et al., 2009). The addition of commercial enzyme products to broiler diets generally results in a significant improvement in performance and a reduction in intestinal viscosity by breakdown of soluble of non starch polysaccharides (Khan et al., 2006).

The effect of feed multi enzyme has been reported to improve in vitro digestibility of starch and acid soluble nitrogen fraction of autoclaved high fiber (Kocher et al .2000). Broiler feed formulation based on ideal protein concept may be a better option than based on CP or total amino acid (AA). Most non-soy vegetable protein sources used in poultry diet formulations are moderate to low in lysine contents; hence supplementation with lysine is inevitable in growing broilers to ensure rapid growth and optimum efficiency of feed utilization (Ahmad et al 2007: Corzo et al .2006)

Feed restriction programs have shown the potential to reduce the incidence of such problems and they can be used to modify birds growth patterns by decreasing their maintenance requirements, which should improve feed efficiency (Urdaneta and Leeson, 2002). There are only limited studies had been conducted to use feed restrictions systems and the results were insignificant on growth performance and carcass characteristics (Petek, 2000; Ozkan et al. 2003; Onbasilar et al.,2009; Demir et al., 2004; Khetani et al., 2008). Nevertheless there is only limited data on studies effects of feed combinations of feed additives and feed restrictions on broiler performance and blood parameters. For this reason the aim of the present study implied an evaluation of the potential of VETA–ZYME PLUS A and different fasting period on performance, carcass yield and blood parameters of broilers.

MATERIALS AND METHODS

1. Experimental animal and housing

This study was carried out in South Valley University, Qena, Egypt (2010). The aim of this research was to determine feed intake, growth performance, carcass traits and blood parameters of broiler chicks fed on basal diet and basal diet with or without enzyme in interaction with fasting period. One Hundred and sixty-eight (168) one-day old Cobb broiler chicks were used in this study. The chicks were randomly divided into two groups in each 4 sub groups (2 diets x 4 fasting periods x 3 replicates in each 7 birds). Birds were distributed into two basal diet groups. The first diet contained crude protein and energy with feed additives (Enzymatic growth promoters VETA –ZYME PLUS A 250 g/ton). The second diet contained crude protein and energy without feed additives. Each diet was subdivided into 4 treatments. The experimental treatments were classified as follow:

Treatment 1 (T1) was fed basal diet with enzyme and the feed was offered adlibitum

Treatment (T2) was fed basal diet with enzyme and the feed was removed for 6 h (from 12:00 to 18:00 h)

Treatment (T3) was fed basal diet with enzyme and the feed was removed for 8 h (from 23:00 to 7:00 h).

Treatment (T4) was fed basal diet with enzyme and the feed was removed for 10 h (from 23:00 to 9:00 h).

Treatment (T5) was fed basal diet without enzyme and the feed was offered adlibitum.

Treatment (T6) was fed basal diet without enzyme and the feed was removed for 8 h (from 12:00 to 18:00 h).

Treatment (T7) was fed basal diet without enzyme and the feed was removed for 10 h (from 23:00 to 7:00 h).

Treatment (T8) was fed basal diet without enzyme and the feed was removed for 10 h (from 23:00 to 9:00 h).

Chicks were brooded in two-tier wire floor a cage of 97× 50 × 45 cm in battery located in windowless house. Chicks of each replicate were housed individually in metabolic cages, made up of metabolic wire mesh.

2. Diet and management

The starter and grower diets were formulated from plant origin (Table 1). The starter and grower diets were formulated to meet the nutrient requirements of broiler chicks according to (NRC 1994) All diets were formulated to have similar levels of lysine and sulphor amino acids as recommended by (NRC 1994) Both starter and grower diets were supplemented with or without enzymatic growth promoter (VETA –ZYME PLUS) as a multi enzymes product containing; Composition :Eash 1 g contains Amylase 550AU ,Protease 2000 PU, Cellulase 400 CU, Lactobacillus acidophilus 200 millions CFU .Carrier : Calcium Carbonate up to 1 g. Management was similar for all treatments. The environmental temperature was about 32 ℃ during the first week old and gradually reduced by about 2 ℃ weekly until about 24 ℃ at the fourth week up to the end of experiment (at 7 weeks of age). Artificial light was provided continuously during night without interruption. Birds in each replicate were weekly weighted and the feed consumed was recorded. Feed conversion (gram feed /gram gain) was calculated for different experimental periods. Mortality was recorded daily and calculated for the entire experimental period.

3. Carcass traits

At 7 weeks of age (end of the experiment), five e birds from each treatment representing the average body weight of such treatment was slaughtered (8 treatments x5 birds = 40 birds). After slaughtering and bleeding, the birds were scalded and feathers were plucked. Carcasses were eviscerated; heads and shanks were separated, then the carcasses were chilled in a tap water for about 10 minutes. Eviscerated carcasses were individually weighted and dressing percentage was calculated (weight of carcass + giblet + abdominal fat/pre-slaughter weight x 100). Percentage of liver, gizzard, spleen and abdominal fat were measured related to carcass weight.

4. Blood measurements

Blood samples were collected from five chicks chosen randomly within each treatment. Samples of about 3 ml of blood were withdrawn from the brachial vein into

collecting tube and centrifuged at 3000 rpm for 15 minutes. Blood serum was then obtained and stored at -20 until analysis. Blood samples were collected at 6 and 7 weeks of age. However, blood samples were betided every time between 7:00 to 7:30 am. At 6 weeks of age, five birds from each treatment were injected intravenously in the brachial vein with 0.2 ml of 10% suspension of packed sheep red blood cells (SRBC). The blood samples were used to determine total protein, glucose, urea, calcium, phosphors, Alanine aminotransferase (ALT) at 7 weeks of age.

5. Statistical analysis

Data were subjected to analysis of variance using general linear model described in SAS User's Guide (SAS Institute, 2005) the following model:

Yik = U +Di+ Fj+ DFij+ EijK

Where:-

Yik = observed value of the concerned trait.

U = observed mean for the concerned trait.

D= the fixed effect due to diet with or without enzyme

Fj= the fixed effect due to fasting system

DiFj = the fixed effect due to fasting system with or without feed additives.

Eijk = Random error.

The differences among the means of individual treatments were tested with Duncan multiple range test (Duncan, 1955) P values less than 0.001 were expressed as '<0.001' rather than the actual value.

RESULTS AND DISCUSSION

1. Feed intake and growth performance.

The effects of diet with or without enzyme and fasting times as shown in **Table 2** revealed that the higher body weight (BW) and body weight gain (BWG) were observed in birds fed on diet supplemented with enzyme than control diet. The highest feed intake and growth performance were observed in birds restricted 6 hours of the feed. Data in **Table 3** which included the interaction between the feed additives and fasting shows that there is no significant different on initial body weight among treatments. The highest body weight and body weight gain was observed in the birds fed on basal diet without enzyme and the feed was removed from 12:00 to 18:00 h (T6) during whole periods. The birds received basal diets with enzyme adlibitum (T1) and without (T5) were higher than other treatments during the whole periods.

Moreover, the highest decrease in body weight and body weight gain was in the treatment that fasted 6 h with enzyme (T2) and 8 h without enzyme (T7) as compared by other treatments. The basal diet with enzyme revealed highest BW and BWG than the basal diet without enzyme. From the performance of the starter and growing period of broilers it could be adduced that feed intake of broilers in the stages of production allows little or no time for catch-up growth to occur (Plavnik and Hurwitz, 1988). The improvements in BW and BWG in T1 may be related to increase the uptake of nutrients from gastrointestinal tract through their indirect effect on its permeability Higgins et al. (2008). The addition of commercial enzyme products to broiler diets generally results in a significant improvement in performance and a reduction in intestinal viscosity by breakdown of soluble of nonstarch polysaccharides (Khan et al., 2006).

These results are in agreement with those of Sandilands et al., (2006) they found that the weight of birds in all restricted treatments increased faster than that of control birds. However Benyi and Habi, (1998) reported that chicks fed *ad libitum*

grew faster and were found to be heavier than those on restricted feeding regimes.

In study of Sandilands et al., (2006) the mean body weight of the control treatment in starter period was higher than that of the restricted feeding treatments. On the contrary Scheideler and Baughman (1993) and Deaton (1995) they stated that restricting feed supply was found to have no significant effect on broiler performance during growing period.

Data in **Table 2, 3** showed that, feed restriction decreased significantly ($P<0.001$) feed consumption in all treatments that fasted 8 or 6 hours as compared by control treatment with or without enzyme during the whole periods. At the 21 - 42 days of age, treated treatments with 8 and 10 hours fasting period were significantly ($P<0.001$) lower in feed consumption than the control treatment and the remaining treated treatments. Generally, the present result was agreement with Lee and Leeson (2001). They found that birds which were subjected to transient feed restriction, generally ate less feed than did full-fed (control birds).

Table 2, 3 indicated that, feed restriction significantly improved ($P<0.05$) the feed conversion ratio at 1-21 days of age in the treated treatment (T4 and T6), which fasted continuously 10 hours with enzyme and 6 hours without enzyme as compared by control treatment and all remaining treated treatments. The birds fasted 6 hours with enzyme or without (T2 and T6) revealed improvements in FCR at growing and whole periods.

2. Carcass measurements

Concerning the carcass (**Table 4**) the carcass weight, dressing % and small intestine weight were higher and abdominal fat % was lower in birds fasted 6 hours than other birds. There is no significant different of the diet with or without enzyme. (**Table 5**) the results indicated that different feed restriction systems with or without supplementation did not significantly affect carcass traits and the relative percentages of liver, gizzard, and the overall dressing percentage. This finding agreed with those reported by Palo et al., (1995). They indicated that restricted feeding did not affect the carcass characteristics and the relative weights of different organs, except the relative weight of liver.

3. Blood parameters

Concerning blood measurements (**Table 6 and 7**) the results indicated that different feed restriction systems with or without supplementation did not significantly affect any of blood measurements including total protein, glucose, calcium, phosphor, urea and alanine aminotransferase. No blood parameter was affected by feed restriction treatments (Junqueira et al., 2003). Such results are similar to those reported by Garcia (1992). The obtained results in Table (7) reveal that neither fating time or enzyme supplementation caused any significant changes in blood measurements.

Conclusion

In conclusion, the results of this study suggest that feed restriction systems in T1 and T6 improved significantly live body weight, weight gain, and feed conversion at starter, grower and whole periods. Feed restriction significantly reduced feed consumption and abdominal fat without any side effects on carcass traits and digestive organs.

Table 1. Composition and calculated analysis of the experimental diets

Ingredients, g/kg	Starter diets (0-3 wks)	Grower diets (4-6 wks)
Yellow corn, ground	531.7	565.2
Soybean meal (44% CP)	320.0	300.0
Corn gluten meal (60% CP)	90.0	60.0
Vit & Min. Premix*	3.0	3.0
Sunflower oil	20.0	40.0
Dicalcium phosphate	20.0	18.0
Limestone	10.0	10.0
Salt	3.8	3.8
DL-methionine	0.5	---
L- lysine	1.0	---
Total	1000	1000
Calculated analysis:		
ME, MJ/Kg	12.6	13.17
Crude Protein, (%)	24.19	21.65
Crude fiber, (%)	3.16	3.05
Crude fat, (%)	4.62	6.65
Ca, (%)	0.93	0.88
P (Available, %)	0.52	0.48
Lysine, (%)	1.27	1.04
Methionine, (%)	0.62	0.41
Price of ton diet (LE), 2005	2600	2400

USD = 5.5 LE

*Each diet was supplied with 2.5 kg/ton Vit. & Min. Mix (commercial source B. p. Max) Each 2.5 kg contains, Vit. A 10,000,000 MIU, Vit. D 2,000,000 MIU, Vit. E 10000 mg, Vit. K3 1000 mg, Vit. B1 1000 mg, Vit. B2 5000 mg, Vit. B6 1500 mg, Biotin 50 mg, BHT 10000 mg, Pantothenic 10000 mg, folic acid 1000 mg , Nicotinic acid 30000 mg Mn 60 gm, Zinc 50 gm, Fe 30 gm, Cu 4 gm, I 3 gm, Selenium 0.1 gm, Co 0.1 gm.

Table 2. Effects of enzyme and fasting on feed intake (FI) and growth performance of broilers from 1- 42 days of age.

Treatment	Body weight			Body weight gain			Feed intake			Feed conversion ratio		
	Initial 1 d	21 d	42 d	1-21 d	21-42 d	1-42 d	1-21 d	21-42 d	1-42 d	1-21 d	21-42 d	1-42 d
Diet with enzyme	42.83	713 b	1698 a	670 b	984 a	1655 a	1240 b	1764 a	3004 a	1.851	1.807	1.818
Diet without enzyme	43.41	737 a	1633 b	693 a	896 b	1590 b	1307 a	1599 b	2906 b	1.905	1.802	1.846
SEM	0.834	1.670	59.50	159.30	118.50	149.70	82.30	124.30	156.20	0.180	0.178	0.144
P-value	0.424	0.013	0.001	0.02	0.001	0.001	0.01	0.001	0.226	0. 172	0.895	0.263
Fasting 0	43	770 a	1742 b	726 a	973 b	1699 b	1353 a	1778 a	3132 a	1.836 ba	1.837 b	1.845 b
Fasting 6 hours	42	750 a	1833 a	707 a	1083 a	1790 a	1246 b	1736 a	2983 b	1.779 a	1.600a	1.666 a
Fasting 8 hours	43	700 b	1595 c	657 b	895 c	1552 c	1240 b	1611 b	2852 c	1.891 ba	1.802 b	1.830 b
Fasting 10 hours	43	681 b	1490 d	673 b	808 d	1446 d	1253 b	1599 b	2553 c	1.989 b	1.980 c	1.970 c
SEM	0.452	1.650	32. 05	25.45	25.14	105.2	58.2	102.1	132.20	0.156	0.165	0.122
P-value	0.921	0.001	0.001	0.001	0.001	0.001	0.02	0.001	0.001	0.013	0.001	0.001

Values in each column are means for 3 replicates of each treatment
SEM: Stander error of means

Table 3. Effects of interaction of enzyme and fasting time on feed intake (FI) and growth performance of broilers from 1- 42 days of age.

Treatment	T1	T2	T3	T4	T5	T6	T7	T8	SEM	P-value
Body weight (g)										
Initial weight 1 day	43	43	43	42	43	43	43	45	0.342	0.63
1-21day	762 b	674 de	703 dc	715 c	776 b	826 a	698 bc	648 e	12.21	<0.001
42 days	1826 b	1783 c	1630 d	1550 e	1659 d	1883 a	1559 e	1430 f	22.21	<0.001
Body gain (g)										
1-21 days	719 b	631 de	659 bc	673 c	734 b	783 a	655 dc	603 e	120.11	<0.001
21-42 days	1064 a	1110 a	923 b	834 c	883 cb	1057 a	862 c	783 d	24.18	<0.001
1-42 days	1783 b	1741 c	1588 d	1508 e	1617 d	1840 a	1517 e	1386 f	30.56	<0.001
Feed intake (g)										
1-21 days	1353 a	1210 bc	1226 bc	11067 c	1349 a	1284 ba	1255 bac	1341 a	16.90	0.005
21-42 days	1824 ba	1879 a	1681 dc	1674 dc	1733 bc	1595 de	1543 e	1625 e	27.40	<0.001
1-42 days	3181 a	3089 a	2907 b	2841 b	3083 a	2879 b	2798 b	2666 b	31.87	0.001
Feed conversion ratio										
1-21 days	1.89 bc	1.91 b	1.86 cb	1.73 cd	1.83 cb	1.63 a	1.91 b	2.22 d	0.036	<0.001
21-42 days	1.71 b	1.69 b	1.81 bc	2.01 d	1.96 cd	1.50 a	1.78 bc	1.95 bc	0.036	0.001
1-42 days	1.78 cb	1.77 b	1.83 cdb	1.88 cd	1.90 d	1.56 a	1.84 cdb	2.06 e	0.029	<0.001

Values in each row are means for 3 replicates of each treatment
SEM: Stander error of means

Table 4. Effects of enzyme and fasting on carcass traits of broilers at 50 days of age.

Treatments	Live body weight (g)	Carcass weight (g)	Dressing %	Abdominal fat %	Liver %	Gizzard %	Spleen weight (g)	Small intestine weight (g)	Small intestine length (cm)
Diet without enzyme	2084	1767	84	680	3.294	3.248	6.75	115	185
Diet without enzyme	2011	1671	83	704	3.374	3.060	6.00	109	180
SEM	65.80	60.17	0.799	0.060	0.190	0.221	0.763	5.730	1.527
P-value	0.350	0.264	0.421	0.741	0.692	0.364	0.509	0.509	0.202
Fasting 0	2072	1788 a	82 a	85 a	3.28	2.80	6.50	113 ab	187
Fasting 6 hours	2126	1807 a	84 a	58 b	3.20	3.40	6.00	123 a	180
Fasting 8 hours	2058	1756 a	85 a	62 b	3.50	3.97	7.00	123 a	184
Fasting 10 hours	1935	1526 b	79 b	70 ba	3.40	3.44	6.00	91 b	197
SEM	81.88	67.01	2.354	0.068	0.203	0.211	0.666	8.906	1.452
P-value	0.362	0.005	0.441	0.045	0.759	0.090	0.748	0.044	0.466

Values in each column are means for 5 replicates of each treatment
SEM: Stander error of means

Table 5. Effects of interaction of enzyme and fasting on carcass traits of broilers at 50 days of age.

Treatment	T1	T2	T3	T4	T5	T6	T7	T8	SEM	P-value
Live body weight (g)	2142	2206	2096	1894	2002	2047	2021	1976	37.9	0.58
Carcass weight (g)	1858	1911	1788	1512	1718	1703	1724	1.540	35.8	0.047
Dressing%	86.6	86.5	85.5	80.3	85.9	83.1	85.5	78.1	0.80	0.274
Liver%	3.27	2.90	3.23	3.76	3.30	3.49	3.75	2.94	0.10	0.274
Abdominal fat%	0.85	0.58	0.62	0.67	0.86	0.58	0.63	0.73	0.04	0.277
Gizzard%	3.15	3.31	2.70	3.81	2.45	3.47	3.24	3.10	0.11	0.063
Spleen weight (g)	7.00	6.00	8.00	6.00	6.00	6.00	6.00	6.00	0.35	0.830
Small intestine weight (g)	110	127	139	85	116	120	105	97	4.66	0.292
Small intestine length (cm)	186	186	189	179	188	174	180	179	1.83	0.401

Values in each row are means for 5 replicates of each treatment
SEM: Stander error of means

Table 6. Effects of enzyme and fasting on some physiological response of broilers at 6 and 7 weeks of age.

Treatment	T1	T2	T3	T4	T5	T6	T7	T8	SEM	P-value
Total protein (g/dl) at 6weeks	2.54	2.83	2.73	2.36	2.31	2.52	2.39	2.63	0.153	0.275
Total protein (g/dl) at 7 weeks	1.53	1.56	1.46	1.53	1.40	1.70	1.50	1.26	0.216	0.944
Glucose (mg/dl) at 6 weeks	10.00	12.33	14.00	12.60	11.00	8.33	9.33	9.66	0.772	0.661
Glucose (mg/dl) at 7 weeks	181	127	177	182	183	190	185	179	7.890	0.662
Urea (mg/dl) at 6 weeks	199	203	199	201	2.4	218	215	219	0.124	0.499
Urea (mg/dl) at 7 weeks	9.30	9.0	12.6	10.6	10.6	9.83	8.33	11.3	0.641	0.831
Calcium (mg/dl) at 6 weeks	1.46	1.47	2.20	2.10	2.40	2.50	2.30	2.30	75.35	0.188
Calcium (mg/dl) at 7 weeks	2.10	2.07	2.50	2.50	2.90	3.10	2.83	2.50	0.142	0.549
Phosphor (mg/dl) at 6 weeks	12.0	13.0	14.0	12.0	11.30	16.50	15.3	14.6	0.527	0.108
Phosphor (mg/dl) at 7 weeks	16.0	15.0	14.0	16.3	15.3	16.3	17.3	15.6	0.532	0.881
ALT (U/L) at 6 weeks	4.86	5.66	5.50	5.75	6.60	5.63	5.30	5.10	0.187	0.842
ALT (U/L) at 7 weeks	4.56	4.70	5.66	6.60	5.70	5.60	5.03	4.53	0.223	0.566

Values in each row are means for 3 replicates of each treatment
SEM: Stander error of means
ALT: Alanine aminotransferase

Table 7. Effects of interaction of enzyme and fasting on some physiological response of broilers at 6 and 7 weeks of age.

Treatment	Diet with Enzyme	Diet without	SEM	P-value	Fasting 0	Fasting 6 hours	Fasting 8 hours	Fasting 10 hours	SEM	P-value
Total protein (g/dl) at 6weeks	2.61	2.96	0.153	0.254	2.420	2.660	3.600	2.990	0.154	0.397
Total protein (g/dl) at 7 weeks	1.28	2.61	0.093	0.181	2.570	2.606	2.870	2.870	0.089	0.642
Glucose (mg/dl) at 6weeks	12.25	9.58	0.216	0.620	10.50	10.33	11.66	11.16	0.220	0.958
Glucose (mg/dl) at 7 weeks	167	184	0.045	0.535	182	159	181	180	0.052	0.361
Urea (mg/dl) at 6weeks	350	214	17.20	0.118	201	210	207	210	17.56	0.934
Urea (mg/dl) at 7 weeks	10.40	10.0	0.778	0.314	10.0	9.41	10.45	11.00	0.772	0.718
Ca (mg/dl) at 6weeks	2.40	1.80 b	0.612	0.022	1.93	2.02	2.25	2.25	0.612	0.429
Ca (mg/dl) at 7 weeks	2.27	2.85	0.142	0.066	2.50	2.62	2.65	2.48	0.152	0.872
P (mg/dl) at 6weeks	12.70	14.50	2.58	0.220	11.66 b	14.83	14.66	13.33	2.50	0.074
P (mg/dl) at 7 weeks	15.30	16.16	2.60	0.650	15.66	15.50	15.83	16.00	3.62	0.986
ALT (U/Lat 6weeks	5.430	5.400	0.91	0.741	5.461	5.512	5.266	5.416	18.0	0.910
ALT (U/L) at 7 weeks	5.20	5.20	1.90	0.488	5.133	5.150	5.350	5.300	2.20	0.491

Values in each row are means for 3 replicates of each treatment
SEM: Stander error of means
ALT: Alanine aminotransferase

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الملخص العربي

تاثير التصويم واضافة الانزيمات علي الاداء الانتاجي وبعض الاستجابات الفسيولوجية لبداري دجاج اللحم

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أجريت هذه الدراسة لتقيم تأثير التصويم واضافة الانزيمات علي وزن الجسم والغذاء الماكول والكفاءة الغذائية وصفات الزبيحة وبعض القياسات الفسيولوجية لدجاج اللحم. استخدم في هذه الدراسة ١٦٨ طائر عمر يوم وتم توزيعهم عشوائيا الي مجموعتين إحداهما التغذية باضافة ٢٥٠ جرام/ طن انزيم فيتا-زيم بلس ١ والاخري بدون اضافة وكل مجموعة تم تقسيمها الي ٤ مجموعات كما يلي بدون تصويم ، تصويم ٦ ساعات ، تصويم ٨ ساعات والاخيرة تصويم ١٠ ساعات. وكانت النتائج المتحصل عليها كالاتي: ليس هناك اي فروق معنوية لتاثير العليقة باضافة انزيم او بدون اضافة علي استهلاك الغذاء والاداء الانتاجي وبعض القياسات الفسيولوجية لدجاج التسمين ولكن كان هناك فروق معنوية لتصويم ٦ ساعات مقارنة بالمجوعات الاخري كما كان لتاثير التداخل بين الانزيم والتصويم تاثير معنوي علي الغذاء الماكول والاداء الانتاجي دون اي تاثير ضار علي مواصفات الزبيحة او بعض القياسات الفسيولوجية.