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Impact of Enzymes Supplementation (α- Amylase and Xylanase) in Diets Contains Corn and Wheat on Performance of Broiler Chickens

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Abstract
Birds are naturally output enzymes for digesting nutrients. However, birds does not have enzymes to moulder fiber perfectly and that enzymes secretion by salivary glands is very limited, especially to digesting high ratio of starch. So we need to add enzymes (α- Amylase and Xylanase) in the feed to aid digestion. The influence of enzyme supplementation on performance and digestibility in broiler chicks was examined for the diet containing corn and wheat with different levels of enzymes, while the diet containing corn and wheat, and adding enzymes of broiler chickes resulted significant (P≤0.05) increases in live body weight, weight gain, feed conversion and carcass weight, The best results for the traits included in this study were recorded by supplementing diet of broiler chicks with enzymes at the level of 0.04 % (T3, T6, and T9).

Introduction

Studies indicate that the food of the most people of the world especially, developing countries is suffering from protein deficiency and since protein, especially animal protein, play important role in human nutrition, its quality and quantity must reach to ideal extent *[1]*. Since poultry meat is an important source of high quality protein, minerals and vitamins to balance the human diet, poultry industry continues to play a significant role in the whole world as the major supplier for animal protein.

Enzymes are importance for optimal performance and nutrient digestibility in broiler chicksfed diets containing high levels of grains rich in non-starch polysaccharides (NSP) *[2; 3; 4]*. At fifty years ago Utilizing enzymes to bird diet is main advances in nutritional. Addition of enzymes supplementation to diets can help to eliminate the effects of anti-nutritional factors and improve the utilization of dietary energy *[5; 6]*. Thus, supplemental enzymes increase digestibility of feed and performance. Supplemental enzymes increase digestibility in broiler chicken caused by action in the crop, pancreas, or small intestine such as Amylase and Xylanase *[7]*. Plants consist several structures that the poultry cannot digestion, in order to the poultry cannot product the necessary enzyme to digest them. Scientists able help the poultry by selecting these indigestible structure and nutrition an adequate enzyme. These enzymes produce from microorganisms under control treatmentled situation *[8]*. Corn is the major source of energy in poultry diets on a global scale *[9; 10]*. And its inclusion rate in commercial diets can be up to 70% *[10]*. Corn used as a main source of energy in bird rations and feed ingredient because of the corn high source of energy that easy to digestion and low soluble non-starch polysaccharides, which are an anti-nutrient factor *[11]*. Corn metabolism energy is main caused by the type of corn starch that is classified into three groups: fast digestion of starch, tardily digestion of starch, and resistant digestion of starch *[12]*. Wheat is an essential surrogate for maize in the

bird ration however dietary modifications request to be made in order to of its anti-nutritive portion, non-starch polysaccharide (NSP) Wheat consists a relatively high level of non-starch polysaccharide (NSP) as a compound of carbohydrate *[13]*, The majority of the carbohydrate portion is derived in the β-glucan and Arabinoxylan in the grain cell wall *[14]*. Xylanase is the major non-starch polysaccharide (NSP) of wheat, and rise levels of wheat in poultry diets able raise the viscosity of the digestive system contents, that hinder the absorption of feeds, causing decreased weight gain, feed intake and feed conversion ratio.

Material and method

This study was applied from the Bakrajo poultry farm, Animal Science Department, College of Agricultural Sciences, University of Sulaimani- Kurdistan region of IRAQ, during the period from March 7th, to April 17th, 2017 to study the impact of Xylanase and α-amylase supplementation on performance of broiler chicks fed on diets containing corn and wheat.

A total of 378 chicks un-sexed day old broiler chicks (Ross 308) commercial broiler chicken were divided into nine groups and each group consisted three replications.

Table-1:The type of feeds and level of enzymes offered for each treatment at 42 days' periods of experiment.

Treatments	***Experimental period***		
	Days (1-42)		
	Feed contained	***α-amylase (mg per kg)***	***Xylanase (mg per kg)***
T1 (control treatment)	*Corn+Wheat*	*0*	*0*
T2	*Corn+Wheat*	*200*	*200*
T3	*Corn+Wheat*	*400*	*400*
T4	*Corn*	*0*	*0*
T5	*Corn*	*200*	-
T6	*Corn*	*400*	-
T7	*Wheat*	*0*	*0*
T8	*Wheat*	-	*200*
T9	*Wheat*	-	*400*

Studied Characteristics

Live body weight, Weight gain, Feed intake, Feed conversion ratio and Mortality percentage.

Statistical Analysis

Utilizing XLSTATprogram, (version 7.5, 2004). For analyzed all data.

The significant differences between means of traits included in this study by utilizing Duncan's multiple comparison test under the likelihood ($p \leq 0.05$) *[15]*.

Table-2: Ingredient of the diets (%)

Ingredients	Diets								
	T1, T2 and T3			T4, T5 and T6			T7, T8 and T9		
	Starter (0-10)	Grower (11-23)	Finisher (24-42)	Starter (0-10)	Grower (11-23)	Finisher (24-42)	Starter (0-10)	Grower (11-23)	Finisher (24-42)
Protein Concentrate	8	5	5	8	5	5	8	5	5
Soybean meal	28	28	26	30	30	25	26.25	26.25	21
Wheat	27.5	29.5	29.5	-	-	-	58	61.5	65
Wheat bran	5	4.5	5.5	7	6	8	5	4	5
Sunflower seed oil	2.5	3	4	2.5	3	4	2.5	3	4
Corn	29	30	30	52.5	56	58	-	-	-
Total	100	100	100	100	100	100	100	100	100
Chemcal composition									
Crude protein	23	22	21	23	22	20	23	22	20
Metabolizable energy (Kcal/Kg)	3000	3100	3150	3000	3100	3150	3000	3100	3150
Calcium	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Lysine	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
Methionine	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58

*Protein concentration utilize in the diets was produced from Holland country by named (WAFI) that consists: (2100) Kcal ME / Kg, (40)% crude protein, (5)% crude fat, (6.5)% calcium, (4)% cysteine, (3.85)% lysine, (3.70)% methionine, (2.50)%phosphorus and (2)% crude fiber.
** The calculated composition of the diets was determined according to [16].

Results and discussion

The results in (Table 3) showing the impact of enzymes supplementation on performance of broiler chicks fed on a diet containing corn and wheat. during 1 day to 42 days. The values of body weight, weight gain, feed intake and feed conversion ratio during the experiment have raised ($p \leq 0.05$) due to the raising of enzymes supplementation. In addition, the effect of enzymes on body weight was significant ($p \leq 0.05$) higher body weight at T2, T3, T5, T6, T8, and T9 compared with the control, treatments T1, T4 and T7, respectively. Schutte *et al.* (1995) *[17]*, Chesson (2010) *[18]* were found significant ($p \leq 0.05$) effect of enzymes on body weight compared with control treatment. Moreover, the effect of enzymes on weight gain was significant ($p \leq 0.05$), higher weight gain at T2, T3, T5, T6, T8 and T9 compared with the control, treatments T1, T4, and T7, respectively. Other researcher reported that enzymes significantly ($p \leq 0.05$) effected on weight gain compared with control treatment *[19; 20; 21]*. Also, the effect of enzymes on feed intake was significant ($p \leq 0.05$) lower feed intake at T2, T3, T5, T6, T8 and T9 compared with their control, treatments T1, T4 and T7, respectively. The results are in agreement with findings of Ranade and Rajmane (1992) *[22]* who reported about effect supplemental enzymes on performance and feed intake indicate addition enzymes supplementation did not effect on feed intake of broiler chicken. Other study reported decreased in feed intake on the addition of enzyme *[23; 24; 25]*. They reported about feed intake reduced with enzymes supplementation. Then, the effect of enzymes on feed conversion ratio was significant ($p \leq 0.05$) better feed conversion ratio at T2, T3, T4, T5, T6, T8 and T9 compared with their control, while T7 is higher feed conversion ratio or control group is better than T7. While, T3 and T6 were significant ($p \leq 0.05$) better feed conversion ratio compared with T2, T8, T5, T8 and T9. In order to, the diet of T3, T6 and T9 contain the high ratio of enzymes that (400)mg/kg compared T2, T5 and T8 their diet contain the low ratio of enzymes that (200)mg/kg. This agrees with the result obtained by Marquardt et al., (1996)*[26]*. Who reported about the enzymes supplementation mixed with diets of broiler chicken indicates the significant effect on feed conversion ratio.

The results in (Table 4) showing the impact of enzymes supplementation on performance of broiler chicksfed on a diet containing corn and wheat during 1 day to 42 days. The value of mortality in all treatments at the age 1 to 42-days old were no significant. In additional there are no significant difference in mortality between all treatments. This agrees with the result obtained by Makkawi , (2009) *[27]* and Mariam et al., (2013) *[28]* reported that enzymes did not effect on mortality rations.

The results in (Table 5) showing the impact of enzymes supplementation on performance of broiler chicksfed on a diets containing corn and wheat during 1 day to 42 days. The value of carcass in all treatments at the age 1 to 42-days old were significant ($p \leq 0.05$).

Effect of treatments on the carcass at T2 and T3 were significant ($p \leq 0.05$) higher carcass compare with T1 (control). Moreover, T6 was significant ($p \leq 0.05$) higher carcass compare to T4 (control treatment). Also, T9 was significant ($p \leq 0.05$) higher carcass compare to T7 (control treatment). This result agrees with the results of other researcher, which they reported increased carcass yield by addition of enzymes in diet [*29; 30; 31; 32]*. and Leeson et al., (1996) *[31]* reported about enzymes supplementation that significant effect ($p \leq 0.05$) on carcass weight of broiler chicken. In addition, the cause of significant ($P \leq 0.05$) T2, T3, T6 and T9, including their diet mix with enzymes compared with their control treatments.

Table-3: Effect of supplemental enzymes on body weight, weight gain, feed intake and feed conversion ratio of broiler chicken from 1-42 day-old (Mean ± SE)

	Body weight (g)	***Weight gain (g)***	***Feed intake (g)***	***Feed conversion ratio (g feed intake/g weight gain)***
T1(control treatment)	*2293.33±41.12e*	*2251.36±13.62fg*	*3908.33±46.12b*	*1.73±0.01b*
T2	*2390.00±44.23bc*	*2348.13±15.43cd*	*3781.00±16.25d*	*1.61±0.02d*
T3	*2453.33±55.66a*	*2411.00±31.63ab*	*3700.33±14.67ef*	*1.53±0.02ef*
T4	*2330.00d±75.05de*	*2286.03±5.97ef*	*3864.33±15.72bc*	*1.69±0.01bc*
T5	*2418.33±41.66ab*	*2375.70±15.71bc*	*3744.33±48.67de*	*1.57±0.02de*
T6	*2471.66a±80.13a*	*2430.43±15.20a*	*3669.33±11.05f*	*1.51±0.02f*
T7	*2240.00±38.22f*	*2199.56±17.75g*	*4002.66±17.14a*	*1.820±0.03a*
T8	*2343.33±40.99cde*	*2303.10±8.24def*	*3835.33±35.57c*	*1.665±0.02c*
T9	*2360.00cd±55.19cd*	*2318.43±20.58de*	*3751.33±7.53de*	*1.61±0.02d*

*a,b,c Means followed by different letters are statistically different ($p \leq 0.05$).

**T1=(control treatment) without enzymes + T2 and T3 their diet consist corn and wheat with enzymes, T4(control treatment) without enzymes + T5 and T6 their diet consist corn with enzymes, also T7(control treatment) without enzymes + T8 and T9 their diet consist wheat with enzymes.

Table-4: Effect of supplemental enzymes on mortality (%) of broiler chicken.(Mean ± SE)

Treatments	***Mortality (%)***
T1(control treatment)	*7.14±0.00*
T2	*11.90±2.38*
T3	*11.90±2.38*
T4	*11.90±8.58*
T5	*7.14±4.12*
T6	*19.04±4.76*
T7	*16.66±2.38*
T8	*9.52±2.38*
T9	*19.04±2.38*

*a,b Means followed by different letters are statistically different ($p \leq 0.05$).

**T1=(control treatment) without enzymes + T2 and T3 their diet consist corn and wheat with enzymes, T4(control treatment) without enzymes + T5 and T6 their diet consist corn with enzymes, also T7(control treatment) without enzymes + T8 and T9 their diet consist wheat with enzymes.

Table-5: Effect of supplemental enzymes on carcass weight (g) of broiler chicken.(Mean ± SE)

Treatments	*Carcass weight (g)*
T1(control treatment)	*1830±10.00def*
T2	*1925±27.538ab*
T3	*1965±22.913a*
T4	*1865±7.638cd*
T5	*1893±29.059bc*
T6	*1950±17.321ab*
T7	*1786±8.819f*
T8	*1805±16.073ef*
T9	*1846±14.530cde*

*a,b Means followed by different letters are statistically different (p≤0.05).
**T1=(control treatment) wıthout enzymes + T2 and T3 their diet consist corn and wheat wıth enzymes, T4(control treatment) wıthout enzymes + T5 and T6 their diet consist corn wıth enzymes, also T7(control treatment) wıthout enzymes + T8 and T9 their diet consist wheat wıth enzymes.
***carcass weight consist breast, yield, wing, bone, neck and liver.

Their diet did not mix with enzymes. Which also, the chemical composition of diet effect on the activity of enzymes because the enzymes are the best reaction with diet has high the energy value .

While T5 had no significant difference in carcass compared her control treatment (T4). Also, T8 had no significant difference in carcass compared with the control treatment (T7). Other studies reported had their was no significant effect on the carcass *[32;33;34; 35]*.

Effect of the supplemental enzymes on body weight compared with the control treatment increased (p≤0.05) during the experiment due to the raised level of enzymes, supplementation and the increase of periods age (Table 6). Body weight was enhancing with increased enzymes supplementation. Moreover, the effect of treatments was significant (p≤0.05) at P4, P5, and P6. At P4 significant (p≤0.05) higher body weight was obtained by birds in T3, T6 and T9 compared with the control treatments T1, T4, and T7, respectively. Also, at P5 significant (p≤0.05) higher body weight was obtained by birds in T3, T5, T6, and T9 compared with their control treatments T1, T4, and T7, respectively. At P6 significant (p≤0.05) higher body weight was obtained by birds in T2, T3, T5, T6, T8, and T9 compared with thecontrol treatments T1, T4, and T7, respectively. This result agrees with the results obtained by Chesson (2010) *[18]* and Jiang et al., (2008)*[19]* were also found the significant effect of enzymes on body weight compared with control treatment. The cause of significant (p≤0.05) T3, T6 and T9 at P4, also T3, T5, T6 and T9 at P5, then T2, T3, T5, T6, T8 and T9 at P6 including their diet mix with enzymes compared with their control treatments that their diet did not mix with enzymes. Which also, the chemical composition of diet effect on the activity of enzymes because the enzymes are the best reaction with diet has high energy value. In addition, there were no significant differences between treatments at other periods, while some researcher such as McCraken and Quintin (2000) *[36]* reported that enzymes supplementary to diets did not impact on body weight of broiler chicks.

Enzymes supplementation also increased (p≤0.05) weight gain during most periods of the experiment with enzymes supplemented groups comparison with the control treatment groups. Influence of the treatments and periods on weight gain were shown in (Table7). The weight gain enhanced with increase enzymes supplementation and the increase of periods age. In addition, the effect of treatments was significant (p≤0.05) at P4 and P6. Also, at P4 significant (p≤0.05) higher weight gain was obtained by birds in T3 and T6 compared with their control treatments T1 and T4, respectively. At P6 significant (p≤0.05) higher weight gain was obtained by birds in T2, T3, T5, T6, T8 and T9 compared with their control treatments T1, T4, and T7 respectively. This result agrees with the result obtained by Sekoni et al., (2008) *[20]*; Kaczmarek et al., (2014) [21] reported that enzymes significantly improved weight gain compared with control treatment. The

cause of significant (p≤0.05) T3 and T6 at P4 and T2, T3, T5, T6, T8 and T9 at P6 including their diet mix with enzymes supplementation compared with their control treatments T1, T4, and T7 that their diet did not mix with any enzymes. Which also, the chemical composition of diet effect on the activity of enzymes because the enzymes are the best reaction with diet has high the energy value. While, other treatments were not any differences between treatments and periods. The age of bird in other periods was low, that is why the enzymes cannot action very good. [37, 38] reported no significant effect in weight gain.

The effect of supplemental enzymes on feed intake and Influence of the treatments and periods on feed intake was significant (p≤0.05) as shown in (Table 8). The feed intake decreased with increase in enzymes supplementation. In addition, effect of treatments on feed intake at P4, P5, and P6 was significant (p≤0.05). At P4 significant (p≤0.05) lower feed intake was obtained by birds in T8 and T9 compared with their control treatments T7. Then, at P5 significant (p≤0.05) lower feed intake was obtained by birds in T2, T3, T5, T6, T8, and T9 compared with their control treatments T1, T4, and T7, respectively. Also, at P6 significant (p≤ 0.05) lower feed intake was obtained by birds in T2, T3, T5, T6, T8, and T9 compared with their control treatments T1, T4, and T7, respectively. While, other studies reported decreased feed intake on the addition of enzyme *[22; 23; 24]*, these results agrees with the results obtained by Marquardt et al., (1996)*[26]* Pettersson and Åman (1989) *[39]*, they reported about feed intake reduced with enzymes supplementation. Moreover, the results are agreement with findings of Ranade and Rajmane (1992) *[22]* who reported about effect supplemental enzymes on performance and feed intake indicate addition enzymes supplementation did not effect on feed intake of broiler chicken. The cause of significant (p≤0.05) lower feed intake T8 and T9 at P4 and T2, T3, T5, T6, T8 and T9 at, P5 and P6 including their diet mix with enzymes supplementation compared with their control treatmentsT1, T4, and T7 that their diet did not mix with any enzymes. Which also, the chemical composition of diet effect on the activity of enzymes because the enzymes are the best reaction with diet has high energy value. While, other treatments were not any differences between treatments and periods. In order to, the age of bird in other periods is low that is why the enzymes can not action is very good.

Data of the feed conversion ratio is noticed in (Table 9). Effect of interaction between treatments and periods on feed conversion ratio during the final period of the experiments have raised (p≤0.05) due to the raised level of enzymes supplementation and raise of periods age. In addition, the effect of treatments was significant (p≤0.05) at P6. Also, at P6 significant (p≤0.05) better feed conversion ratio was obtained by birds in T2, T3, T6, T8, and T9 compared with their control treatments T1, T4, and T7, respectively. These results agrees with the results obtained by other researchers, which they reported about the enzymes supplementation mixed with diets of broiler chicks indicates the significant effect on feed conversion ratio *[26; 40; 41; 42; 43]*. The cause of significant (p≤0.05) T2, T3, T6, T8 and T9 at P6 including their diet mix with enzymes supplementation compared with their control treatments T1, T4, and T7 that their diet did not mix with any enzymes. Which also, the chemical composition of diet effect on the activity of enzymes because the enzymes are the best reaction with diet has high energy value. When, other treatments were not any differences between treatments and periods. In order to, the enzymes cannot actives are very good because the age of birds in other periods is low. In addition, some reported about this like *[42]*. There were no significant differences in feed conversion between birds.

Table-6: Effect of supplemental enzymes on body weight (g) of broiler chicken that diets containing corn + wheat, corn and wheat. (Mean ± SE)

	Periods (days)						
Treatments	**First day**	**P1 (2-7)**	**P2 (8-14)**	**P3 (15-21)**	**P4 (22-28)**	**P5 (29-35)**	P6 (36-42)
T1 (control treatment)	41.96±0.95	101.66±1.99	200.00±5.66	400.00±12.45	805.00±14.74c	1613.33±30.50cd	2293.33±41.12d
T2	41.86±1.03	105.00±1.03	194.33±7.40	400.00±14.28	824.33±32.32bc	1616.66±51.17bcd	2390.00±44.23b
T3	42.33 ±0.86	101.66±2.27	196.66±5.44	403.33±7.13	856.66±17.25ab	1688.33±90.89ab	2453.33±55.66a
T4	43.96±1.55	103.66±3.44	198.33±8.55	394.33±14.23	810.00±31.04c	1616.66±39.37cd	2330.00±75.05c
T5	42.63±1.00	104.33±3.18	204.33±3.09	403.33±5.64	826.66±1.25 bc	1660.00±23.41bc	2418.33±41.66b
T6	41.23±3.45	96.00±1.33	201.00±4.66	408.33±11.33	878.33±22.66a	1693.33±40.16a	2471.66±80.13a
T7	40.4±2.33	97.33±2.44	195.00±5.47	389.333±5.33	803.33±17.44c	1581.66±40.12d	2240.00±38.22e
T8	40.23±4.22	92.66±4.11	193.66±6.33	391.00±2.76	830.00±33.14 bc	1623.33±30.17abcd	2343.33±40.99c
T9	41.567±1.33	99.33±1.95	200.00±3.44	395.33±6.33	846.66±19.33abc	1640.00±40.25abcd	2360.00±55.19c

*a,b,c Means followed by different letters are statistically different (p≤0.05). **T1=(control treatment) without enzymes + T2 and T3 their diet consist corn and wheat with enzymes, T4(control treatment) without enzymes + T5 and T6 their diet consist corn with enzymes, also T7(control treatment) without enzymes + T8 and T9 their diet consist wheat with enzymes.

Table-7 : Effect of supplemental enzymes on weight gain (g) of broiler chicken that diets containing corn + wheat, corn and wheat. (Mean ± SE)

	Periods (days)					
Treatments	**P1 (7)**	**P2 (14)**	**P3 (21)**	**P4 (28)**	**P5 (35)**	**P6 (42)**
T1 (control treatment)	59.70±0.93	98.33±4.66	200.00±11.55	405.00±15.74c	808.33±40.50abc	680.00±51.12b
T2	63.13±2.03	89.333±6.40	205.66±10.28	424.33±20.32bc	792.33±45.17abcd	773.33±64.23a
T3	59.33±0.57	95.00±3.44	206.66±5.13	453.33±14.25ab	831.66±61.89a	765.000±35.66a
T4	59.70±1.44	94.66±6.55	196.00±11.23	415.66±22.04bc	806.66±50.37abc	713.33±65.05ab
T5	61.70±2.18	100.00±7.09	199.00±7.64	423.33±19.25bc	833.33±34.41a	758.33±51.66a
T6	54.76±0.33	105.00±3.66	207.33±9.33	470.00±18.66a	815.00±40.33ab	778.33±70.13a
T7	56.90±1.44	97.667±7.47	194.33±8.33	414.00±21.34bc	778.33±60.12bcd	658.33±48.22b
T8	52.43±2.11	101.00±5.33	197.33±12.76	439.00±30.17abc	793.33±50.17abcd	720.00±35.99ab
T9	57.76±3.34	100.66±5.44	195.33±13.33	451.33±21.44abc	793.33±48.25abcd	720.00±45.33ab

*a,b,c Means followed by different letters are statistically different(p≤0.05). **T1=(control treatment) without enzymes + T2 and T3 their diet consist corn and wheat with enzymes, T4(control treatment) without enzymes + T5 and T6 their diet consist corn with enzymes, also T7(control treatment) without enzymes + T8 and T9 their diet consist wheat with enzymes.

Table-8: Effect of supplemental enzymes on feed intake (g) of broiler chicken that diets containingcorn + wheat, corn and wheat. (Mean ± SE)

	Periods (days)					
Treatments	**P1 (7)**	**P2 (14)**	**P3 (21)**	**P4 (28)**	**P5 (35)**	**P6 (42)**
T1 (control treatment)	95.00±1.17	175.00±4.66	278.33±11.45	651.66±12.74abc	1335.00±31.50b	1373.33±46.12ab
T2	93.33±1.55	168.33±5.40	272.66±15.28	641.66±8.32bc	1286.667±41.17cd	1318.33±54.23de
T3	96.66±1.27	171.66±3.95	273.66±8.13	635.00±13.25c	1233.33±61.89e	1290.00±39.66fg
T4	93.33±3.44	171.66±7.11	281.000±10.25	658.33±22.04ab	1296.66±71.37c	1363.33±65.34b
T5	93.33±2.18	170.00±4.20	276.00±6.56	641.66±11.25bc	1250.00±41.41de	1313.33±48.67def
T6	93.33±1.93	171.66±5.33	271.00±11.44	633.33±12.66c	1220.00±53.16e	1280.00±60.13g
T7	97.66±2.44	180.00±5.16	283.33±10.45	668.33±15.44a	1376.66±38.12a	1396.66±78.22a
T8	101.66±2.11	174.33±3.45	277.66±7.76	638.33±18.14bc	1286.66±61.17cd	1356.66±60.99bc
T9	96.66±2.45	169.33±4.44	274.33±6.77	634.33±21.33c	1246.66±50.25e	1330.00±75.22d

*a,b,c Means followed by different letters are statistically different (p≤0.05).**T1=(control treatment) wıthout enzymes + T2 and T3 their diet consist corn and wheat wıth enzymes, T4(control treatment) wıthout enzymes + T5 and T6 their diet consist corn wıth enzymes, also T7(control treatment) wıthout enzymes + T8 and T9 their diet consist wheat wıth enzymes.

Table- 9: Effect of supplemental enzymes on feed conversion ratio (g) of broiler chicken that diets containing corn + wheat, corn and wheat. (Mean ± SE)

	Periods (days)					
Treatments	**P1 (7)**	**P2 (14)**	**P3 (21)**	**P4 (28)**	**P5 (35)**	**P6 (42)**
T1 (control treatment)	1.59±0.07	1.78±0.06	1.39±0.03	1.61±0.9	1.65±0.14	2.02±0.08 ab
T2	1.47±0.03	1.90±0.10	1.32±0.12	1.51±0.17	1.62±0.18	1.71±0.21 bc
T3	1.65±0.07	1.85±0.08	1.32±0.05	1.41±0.10	1.48±0.15	1.69±0.17 bc
T4	1.58±0.04	1.81±0.9	1.43±0.06	1.584±0.9	1.60±0.12	1.91±0.07 abc
T5	1.51±0.02	1.70±0.11	1.39±0.12	1.52±0.16	1.50±0.19	1.73±0.13bc
T6	1.70±0.05	1.64±0.13	1.31±0.10	1.35±0.15	1.49±0.17	1.64±0.20 c
T7	1.72±0.04	1.84±0.05	1.45±0.06	1.61±0.11	1.76±0.16	2.13±0.15 a
T8	1.93±0.06	1.72±0.07	1.41±0.05	1.45±0.10	1.62±0.13	1.88±0.14 bcd
T9	1.67±0.03	1.68±0.9	1.40±0.07	1.40±0.09	1.57±0.15	1.84±0.18 bcd

*a,b,c Means followed by different letters are statistically different (p≤0.05).**T1=(control treatment) wıthout enzymes + T2 and T3 their diet consist corn and wheat wıth enzymes, T4(control treatment) wıthout enzymes + T5 and T6 their diet consist corn wıth enzymes, also T7(control treatment) wıthout enzymes + T8 and T9 their diet consist wheat wıth enzymes.

[a-d] means with different letter significantly differ (P≤0.05).

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