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Effect of enzyme complex at different wheat-based diets on growth performance of broilers

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Abstract
The present study investigated the effect of enzyme complex at different wheat-based diets on the growth performance of broilers at Poultry Research and Training Centre, Department of Poultry Production, UVAS, Pattoki, Pakistan from May 2014 to February 2015. Seven diets containing different levels of wheat (0, 15, 20, 25%) and wheat supplemented with different levels of enzyme (15, 20, 25%) were fed to 525 birds (n=75/treatment for 5 replicates) for 35 days and growth performance was observed. The enzymatic supplementation significantly increased ($P<0.05$) feed intake (1118.76±13.47 vs 1026±11.36), FCR (2.21±0.09 vs 2.05±0.02) and intestinal weight (89.66±5.89 vs 70.86±4.09). Moreover, immune organ and body organ weight was also increased ($P<0.05$). However, enzyme supplementations did not increased body weight (1806.80±24.54 vs 1846.04±6.82) and higher enzyme supplementations increased mortality rate (4.00 vs 1.33). It was concluded that enzymatic supplementation increases growth performance through nutrients availability by breaking fibers which otherwise are not digested.

Keywords: Allzyme, broilers, wheat diets, performance

1. Introduction

Poultry has been on the earth for over 150 million years, dating back to the original wild jungle fowl, now includes several species like chickens, turkeys, ducks, geese, pheasants, pigeons, peafowl and guinea fowl [1]. Among all species, chicken is most extensively reared all over the world as the cheapest source of energy and protein. Moreover, it plays the significant role for mankind through the food supply, income, and employment generation, providing raw materials to industries and facilitating research works. Furthermore, it is regarded as the largest commercial industry providing eggs and meat to mankind [2].

Feed cost contributes about 70% of total poultry production cost per bird [3]. Non-starch polysaccharides (NSPs) include celluloses, hemicelluloses, pectins, and oligosaccharides. In wheat, NSPs are mainly arabinoxylans (average 6% in dry matter), β-glucans (average 0.8% in dry matter) and cellulose (average 2% in dry matter) [4, 5]. They can also be divided into water soluble and water insoluble fractions. Birds usually do not possess endogenous enzymes capable of cleaving and digesting NSPs. The water insoluble NSPs can be considered practically undigested by poultry, however, water soluble NSP has potential to be digested by birds [5]. Wheat is one of the most commonly used cereal grains in poultry feeds. However wheat contains significant amounts of soluble non-starch polysaccharides (sNSP). High levels of NSPs can result in increased viscosity in the small intestine of chickens and depress nutrient utilization and performance [6].

There is a steadily growing interest in the feeding of whole wheat with different poultry species, including broiler chickens [7]. This interest has primarily been fueled by the possibility to save wheat grinding costs and to improve gizzard function and the efficiency of digestion. Feeding of whole wheat helps the chicken to develop a bigger and stronger gizzard, which has a beneficial effect on the function of the entire digestive tract [8]. The gizzard is a dynamic organ with a size closely correlated with the fiber content and particle size of the ration [9]. The increased size of gizzard, due to high frequency and strength of its contractions results in reducing the size of feed particles [10]. Ross 308 broiler chickens, fed whole wheat grains at an inclusion level of 5 to 50%, showed significantly larger gizzards in relation to their body size [11]. Several other studies have also demonstrated improvements of nutritive value, feed utilization, body weight gain, composition and activity of intestinal microbiota, and reduction in excreta volume after supplementation of wheat-based diets with NSP-degrading enzymes such as cellulases, pectinases, hemicellulases, ara bino xylanases and β-glucanases [12].

Allzyme SSF is a commercially available feed enzyme produced by a unique solid-state fermentation through non-genetically modified fungus *Aspergillus Niger*. It possesses the activities of seven enzymes (protease, pentosan rase, beta-glucanase, cellulase, phytase, amylase, and pectinase), which are capable of degrading protein, pentosans, cellulose, phytate and starch, therefore improving the digestibility and absorption of nutrients in the avian intestinal tract [13]. Moreover, In *vitro* studies had revealed that enzymes produced by solid-state fermentation (SSF) are more efficient in releasing the nutrients than as compared to enzymes produced by regular submerged liquid fermentation [14]. Furthermore, Allzyme SSF released more phytate-bound phosphorus (11.0% and 7.8% in wheat and maize-based diets, respectively) and alpha-amino nitrogen (1.7% and 6.2% in wheat and maize-based diets, respectively) compared to non-SSF enzymes [15].

The feed in which Allzyme SSF can be reformulated through the reduction of its energy value by 75 kcal and the reduction of its Ca and P content by 0.1% thus reducing its production cost and maintaining its high production performances [16]. When Allzyme SSF is used, the broiler chickens feed must be reformulated through the reduction in energy by 60 kcal/kg [17]. Supplementing cereal-based diets with enzyme preparations capable of hydrolyzing endosperm cell walls, may improve dietary nutrient availability by several means. Endoxylanase degrades the xylan backbone of arabinoxylan into small units which have several beneficial consequences. It renders the xylose units more available to monogastric [18].

The objective of present study was to replace corn with wheat at different inclusion levels using enzymatic complex and to evaluate the effect of this diet on weight gain, feed conversion ratio (FCR), percentage mortality, immune organs, heart, liver, gizzard, spleen, intestinal length and weight of broilers.

2. Materials and Methods

2.1 Experimental Animals and Site

The experiment was conducted at the environmentally controlled shed of Poultry Research and Training Centre, Department of Poultry Production, UVAS, Pattoki, Pakistan from May 2014 to February 2015. Birds were cared for according to animal protocols approved by an ethical committee. According to body requirements, initially, the housing temperature was maintained at 32 °C. After a week it was reduced to 29.2 °C (2.8 °C) and in the same way every week it was reduced to reach a constant temperature of 20 to 22 °C at the end of 4th week of age. A total of 525 day-old straight-run broiler chicks of Hubbard strain were distributed in 35 experimental units, each having 15 birds. Seven different types of broiler diets were formulated on iso-caloric and iso-nitrogenous with CP- 21% and M.E 2900 Kcal/kg (Table 1). The experimental birds were fed *ad-libitum* balanced ration prepared according to prescribed standards [19]. Enzymatic complex (Allzyme SSF) was used. The recommended dose is 0.02% or 200 mg dry product per ton of poultry feed. The Complete dietary plan is mentioned in Table 2 and 3. Each trial was replicated five times. Parameters of study include weight gain, feed conversion ratio (FCR), percentage mortality, immune organs, heart, liver, gizzard, spleen, intestinal length and weight of broilers. Body weights and feed intake were recorded on a pen basis at starter, grower, and finisher 35-day trial period.

Feed conversion ratio (FCR) was calculated weekly as

Feed Intake (g) = Feed offered (g) – Feed refused (g)

Body weight gain (g) = Final body weight (g) – Initial body weight (g)

FCR= Feed consumed (g)/ weight gain (g)

Table 1: Experimental Dietary Treatments

Treatments	Diets	Composition
T1	A (control)	Commercial Broiler Diet (C.P 21% and M.E 2900 Kcal/Kg)
T2	B	Diet having 15% wheat and 27.3% corn (C.P 21% , M.E 2900 Kcal/Kg)
T3	C	Diet having 15% wheat and 27.3% corn+ 0.02% Enzymatic complex (C.P 21% , M.E 2900 Kcal/Kg)
T4	D	Diet having 20% wheat and 19.1% corn (C.P 21% , M.E 2900 Kcal/Kg)
T5	E	Diet having 20% wheat and 19.1% corn+ 0.02% Enzymatic complex (C.P 21% , M.E 2900 Kcal/Kg)
T6	F	Diet having 25% wheat and 14.95% corn (C.P 21% , M.E 2900 Kcal/Kg)
T7	G	Diet having 25% wheat and 14.95% corn+ 0.02% Enzymatic complex (C.P 21% , M.E 2900 Kcal/Kg)

Table 2: Composition of Experimental Diets

Ingredients	Diet A (%)	Diet B (%)	Diet C (%)	Diet D (%)	Diet E (%)	Diet F (%)	Diet G (%)
Wheat	------	15.000	15.000	20.000	20.000	25.000	25.000
Corn, Grain	40.110	27.300	27.300	19.150	19.150	14.950	14.950
Wheat Bran	-----	10.000	10.000	10.000	10.000	10.000	10.000
Rice Tips	10.300	8.000	8.000	8.000	8.000	8.000	8.000
Rice Polish	7.600	7.000	7.000	7.000	7.000	7.000	7.000
Molasses	3.000	3.355	3.335	3.310	3.305	3.160	3.305
Fish Meal	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Corn Gluten Meal-60	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Canola Meal	9.400	7.315	7.330	10.650	10.650	10.000	10.000
Soybean Meal-48	24.700	17.500	17.500	17.500	17.500	17.500	17.500

DL-Methionine	0.150	0.160	0.170	0.170	0.160	0.170	0.170
Limestone	0.860	0.650	0.650	0.650	0.650	0.650	0.650
L-Therionine	0.100	0.060	0.070	0.070	0.06	0.07	0.07
Lysine Sulfate (70%)	0.220	0.620	0.615	0.620	0.605	0.630	0.605
Common Salt	0.300	0.170	0.170	0.160	0.170	0.170	0.160
Vitamin Premix	------	0.220	0.220	0.220	0.220	0.220	0.220
Di-calcium phosphate	1.260	0.650	0.620	0.50	0.510	0.480	0.350
Enzymatic complex	-----------	----------	0.02	---------	0.02	--------	0.02

Table 3: Nutrient Profile of the Experimental Diet

Nutritional Profile	Diet (A)	Diet (B)	Diet (D)	Diet (F)
Crude Protein (%)	21	21	21	21
Metab. Energy (kcal/kg)	2900	2900	2900	2900
Lysine (%)	1.126	1.26	1.27	1.27
Methionine (%)	0.47	0.5	0.5	0.51
Met+ Cys (%)	0.86	0.93	0.93	0.94
Threonine (%)	0.78	0.75	0.75	0.75
Calcium (%)	0.90	0.90	0.90	0.90
Phosphorous (a) (%)	0.45	0.45	0.45	0.45
Ash (%)	5.51	4.45	4.38	4.20
Sodium (%)	0.20	0.18	0.18	0.18
Ether extract (%)	4.00	3.86	3.5	3.38
Crude fiber (%)	3.57	4.40	5.20	5.60
Linolinic acid (%)	1.20	1.25	1.20	1.15

2.2 Sample collection

On the 35th day, 5 birds from each replicate were selected; their live weight was first calculated and then slaughtered removing feathers (dressed weight). Dressing percentage was determined by dividing dressed weight by live weight multiply by hundred. At the end of the experiment, randomlyiselectedi5 birds from each replicate were slaughtered by carotid artery and jugular vein and the carcass was eviscerated. The spleen, thymus, bursa were carefully dissected out and weighed. Other body organs included liver, heart, gizzard weight were weighed. Intestinal weight and length were calculated. Intestinal length showed that if more length then absorption of nutrient was more in the intestine. At the end, mortality was also calculated.

2.3 Statistical analyses

Data thus collected was analyzed by using one-way ANOVA in Completely Randomized Design (CRD) [20] with help of a computer-based statistical package (SAS). The significance level was set at P<0.05.

3. Results

3.1 Weekly feed consumption

The data regarding average feed consumption showed that in the first and 3rd week, diet C was significant from other diets (Table 4). While in 2nd-week diet B was significant from control. In the 4th week, diet D was significant from control. However, in the 5th week, diet E was significant from the standard diet (control group).

Table 4: Effect of Enzymatic complex on Weekly Feed Intake (gm)

Treatments \ Weeks	W1	W2	W3	W4	W5
A	110.12±0.65^{bcd}	313.76±3.07^{b}	635.60±10.44^{b}	843.68±9.26^{c}	1026.00±11.36^{c}
B	111.76±0.93^{bc}	321.16±2.42^{a}	633.80±9.44^{bc}	844.24±10.05^{c}	1064.00±13.47^{b}
C	109.20±1.07^{cd}	312.44±1.96^{b}	612.60±7.17^{c}	850.44±8.51^{bc}	1079.84±15.52^{b}
D	115.40±0.92^{a}	317.00±1.57^{ab}	637.28±6.22^{b}	888.96±8.71^{a}	1082.71±12.69^{ab}
E	108.00±1.51^{d}	314.84±1.63^{b}	650.96±7.86^{b}	824.56±8.30^{c}	1067.53±13.63^{b}
F	112.60±1.24^{ab}	316.32±1.28^{ab}	673.44±5.54^{a}	878.60±10.04^{a}	1118.76±13.47^{a}
G	113.08±1.06^{ab}	314.76±1.11^{b}	642.60±5.32^{b}	874.28±6.96^{ab}	1063.48±10.24^{b}

3.2 Average body weight

In the case of diets which were offered the different levels of wheat and enzymatic complex supplemented were observed that as dietary levels of wheat increased, feed intake was increased and weight gain decreased. The maximum body weight (1846.04 gm) was recorded in group 'A' supplemented with the control diet. While minimum weekly body weight (1806.80 gm) was recorded in group 'E' supplemented with 20% wheat and enzymatic complex (Table 5). Analysis of variance of body weight gain at day 35 showed the non-significant difference (P>0.05) in different treatments.

Table 5: Effect of Enzymatic complex on Average Body Weight (gm)

Treatments \ Weeks	W1	W2	W3	W4	W5
A	154.84±2.00^{a}	404.84±3.56^{a}	839.80±8.53^{a}	1345.60±5.93^{a}	1846.04±6.82^{a}
B	146.36±0.84^{c}	385.32±2.55^{c}	800.36±6.60^{cd}	1296.72±4.75^{c}	1817.48±11.89^{b}
C	152.72±0.99^{ab}	395.04±1.91^{b}	818.68±4.81^{b}	1325.48±5.39^{b}	1830.92±24.70^{ab}
D	148.44±1.15^{c}	381.48±1.62^{cde}	800.60±6.11^{cd}	1309.12±6.23^{c}	1820.32±18.29^{b}
E	149.08±1.25^{bc}	383.60±1.53^{cd}	813.20±5.84^{bc}	1301.20±6.47^{c}	1806.80±24.54^{b}
F	146.72±1.13^{c}	376.96±1.56^{e}	803.40±4.06^{bcd}	1306.36±6.05^{c}	1842.08±23.73^{a}
G	150.00±1.06^{bc}	378.00±1.65^{de}	792.32±3.61^{d}	1300.64±4.43^{c}	1818.72±24.51^{b}

3.3 Feed conversion rate

When the data of feed conversion ratio of groups was statistically analyzed, feed conversion ratio of group C and E was significantly (P<0.05) higher from groups A (2.05), B (2.05), D (2.16), F (2.16) and G (2.14) while the feed conversion ratio of all groups A, B, C, D, E, F, and G were found non-significantly (P>0.05) different from each other. The best feed conversion ratio was shown by groups A and B (2.05) (Table 6).

Table 6: Effect of Enzymatic complex on Weekly FCR

Weeks / Treatments	W1	W2	W3	W4	W5
A	0.96±0.01[b]	1.25±0.01[c]	1.46±0.01[d]	1.67±0.01[c]	2.05±0.02
B	1.05±0.008[a]	1.34±0.01[b]	1.52±0.01[bc]	1.70±0.01[bc]	2.05±0.03
C	0.97±0.01[b]	1.29±0.01[c]	1.44±0.007[d]	1.68±0.01[bc]	2.21±0.06[a]
D	1.067±0.01[a]	1.36±0.01[ab]	1.52±0.01[bc]	1.75±0.01[a]	2.16±0.05[b]
E	0.99±0.009[b]	1.34±0.009[b]	1.51±0.01[c]	1.69±0.01[bc]	2.21±0.09[a]
F	1.05±0.01[a]	1.37±0.009[ab]	1.58±0.01[a]	1.74±0.01[a]	2.16±0.07[b]
G	1.02±0.01[a]	1.38±0.01[a]	1.55±0.009[ab]	1.72±0.01[ab]	2.14±0.08[b]

3.4 Mortality and Dressing percentage

Maximum mortality (5.33%) was recorded in group F which was offered with feed 25% wheat and no enzymatic complex than other groups followed by G, D, E, C, B and A. The minimum mortality% age was shown in groups E, C, B and A (Table 7). Analysis of variance for dressing percentage showed non-significant differences (P>0.05) among different treatments. Average dressing percentage of broilers in treatments. A, B,.C,.D,.E,.F, and.G were 65.27, 63.71, 63.19, 63.08, 63.54, 63.62 and 63.11% respectively (Table 7). The highest dressing percentage (65.27%) was recorded in treatment 'A' supplemented with control diet and lowest (63.08%) was observed in treatment 'D' supplemented with 20% wheat and without enzymatic complex. Statistical analysis showed that dressing percentage among groups was non-significant (P>0.05) different to each other.

Table 7: Mortality percentage and dressing percentage

Treatments	Mortality%	Dressing percentage (%)
Ai	1.33	65.27±0.34
Bi	1.33	63.71±0.71
Ci	1.33	63.19±0.87
Di	2.67	63.08±0.76
E	1.33	63.54±0.61
Fi	5.33	63.62±0.78
G	4.00	63.11±0.80

3.5 Immune organs weight

Average pancreas weight of broilers in groups A, B, C, D, E, F, and G was recorded 5.04, 11.14, 4.38, 5.22, 4.34, 4.54 and 3.66 gm. The maximum weight was observed in group 'B' supplemented with 15% wheat and without enzymatic complex. The minimum weight was recorded in group 'G' supplemented with 25% wheat and enzymatic complex. The maximum value of pancreas weight was shown group B and significant (P<0.05) different from other groups. Average bursa of the fabricius weight of broilers in groups A, B, C, D, E, F, and G was recorded 2.10, 1.87, 1.61, 2.11, 1.95, 1.87, and 2.39 gm respectively (Table 8). The maximum weight was observed in group 'G' supplemented with 25% wheat and enzymatic complex. The minimum weight was observed in group 'C' supplemented with 15% wheat and enzymatic complex. The maximum value of bursa weight was shown in group D and significant different with group C and other groups were non-significant (P>0.05) different to each other. Average thymus weight for groups A, B, C, D, E, F, and G was observed 10.19, 8.56, 8.31, 11.09, 8.19, 8.09 and 11.72 gm, respectively. The maximum weight was observed in group G supplemented with 25% wheat and enzymatic complex. The minimum weight was observed in group F supplemented with 25% wheat and without enzymatic complex. The maximum value of thymus was shown in group G which was significant (P<0.05) different between groups A, B, C, E and F, and non-significant to group D.

Table 8: Effect of Enzymatic complex on Immune Organs

Weeks Treatments	Bursa weight	Pancreas weight	Thymus weight
A	2.10±0.14[ab]	5.04±0.25[b]	10.19±0.84[ab]
B	1.87±0.13[ab]	11.14±4.33[a]	8.56±0.62[b]
C	1.61±0.15[b]	4.38±0.24[b]	8.31±0.78[b]
D	2.11±0.18[ab]	5.22±0.22[b]	11.09±0.78[a]
E	1.95±0.25[ab]	4.34±0.28[b]	8.19±0.95[b]
F	1.87±0.16[ab]	4.54±0.34[b]	8.09±0.84[b]
G	2.39±0.26[a]	3.66±0.32[b]	11.72±0.89[a]

3.6 Body organs weight

The maximum value of heart weight was shown in group A followed by groups E, C, D, F, G, and B. Result of heart weight of group A was significantly different (P>0.05) to all other groups and values of B and G were non-significant to each other. The maximum value of liver weight was shown in group G followed by the groups C, F, B, D, E, and A. The maximum value of filled gizzard was shown birds of treatment G followed by F, A, D, B, E and C. The maximum value of empty gizzard was shown birds of treatment G followed by F, A, E, C, B and A. Results of A, B, D, and E were non-significant to each other (Table 9). The maximum value of spleen weight was shown by treatment D followed by F, G, E, A, C, and B. Results of all groups were non-significant to each other in case of spleen weight.

Table 9: Effect of Enzymatic Complex on Body Organs (gm)

Weeks / Treatments	Heart weight	Liver weight	Gizzard weight empty	Gizzard weight filled	Spleen weight
A	16.00±1.76[a]	44.54±2.21[b]	34.18±1.53[bc]	47.67±1.97[bc]	2.68±0.14
B	12.25±0.63[b]	45.29±1.81[b]	31.92±1.27[bc]	45.83±2.21[bc]	2.18±0.09
C	13.68±1.86[ab]	47.06±2.50[ab]	31.96±1.19[bc]	41.01±2.10[c]	2.47±2.20
D	13.18±0.53[ab]	45.10±1.82[b]	30.31±1.19[c]	46.19±2.17[bc]	5.22±0.22[a]
E	13.85±0.87[ab]	44.72±1.08[b]	33.19±1.17[bc]	44.89±2.15[bc]	3.02±0.21
F	12.98±0.54[ab]	46.92±1.30[ab]	36.02±2.12[ab]	50.59±2.69[b]	4.59±2.00[a]
G	12.33±0.57[b]	51.30±1.89[a]	40.13±3.07[a]	58.54±3.45[a]	3.09±0.22

3.7 Intestinal weight and length
The maximum value of intestinal weight filled was observed in group E supplemented with 20% wheat and enzymatic complex and the minimum value of intestinal weight filled were observed in group G supplemented with 25% wheat and enzymatic complex. The maximum value of intestinal weight empty was observed in group E supplemented with 20% wheat and enzymatic complex and the minimum value were observed in group A supplemented with the control diet. Analysis of variance for intestinal weight filled and empty was the significant difference ($P<0.05$) (Table 10). The maximum value of intestinal length was observed in the group (C) and the minimum value was observed in the group (F). Analysis of variance for intestinal length was the significant difference ($P<0.05$).

Table 10: Effect of Enzymatic complex on Intestinal Weight (gm) and Length (cm)

Weeks / Treatments	Intestinal Length	Intestinal weight empty	Intestinal weight filled
A	83.24±4.04^{b}	49.74±4.10^{b}	70.86±4.09^{bc}
B	84.44±6.79^{b}	58.10±6.86^{ab}	81.62±6.70^{ab}
C	89.45±8.71^{b}	57.93±6.73^{ab}	72.57±6.25^{abc}
D	86.64±9.12^{b}	52.18±7.75^{b}	77.10±7.38^{abc}
E	87.26±6.10^{b}	73.66±5.89^{a}	89.66±5.89^{a}
F	81.66±5.85^{b}	54.50±4.83^{b}	72.78±4.72^{abc}
G	141.56±7.80^{a}	50.89±3.15^{b}	62.77±2.86^{c}

4. Discussion
The results showed that minimum feed consumption was exhibited in group 'E' which was fed the diet containing 20% wheat and enzymatic complex. Significant improvement of broiler chickens body weight (2165 g versus 2086 g) and a reduction of feed conversion factor (1.81 kg versus 1.88 kg) as a result of the use of Allzyme SSF and it also led to a significant reduction of casualties and to an intestinal viscosity reduction. The decrease in feed intake might be related to improving nutrient absorption by i) the release of bound nutrients by dissolving in the cell wall matrix and the decrease of digesta viscosity. The beneficial effects of xylanase and phytase inclusion on growth performance in wheat-based broiler diets were also reported by [8]. Enzyme supplementation had little bit diverse effects on feed intake which was decreased due to more nutrient availability. However, our findings were controversial to [18] who determined the effect of supplementations phytase and xylanase individually or in combination both enzymes on nutrient utilization and broiler performance fed wheat-based diet. Feed intake was decreased in control diet instead of positive control diet supplemented with phytase. Xylanase had no effect on performance. Moreover, the addition of xylanase wheat-based diet improved the BWG and reduced FCR and digesta viscosity ($P<0.05$) [21]. Furthermore, the wheat used in two ways of a mixed feeding and free choice feeding system offered to broilers. Mixed feeding had no effects on feed intake but in contrast, FCF treatment had the lowest feed intake [22]. Compared to the control, chickens fed diets containing whole wheat increased gizzard weight by 46.2 and 62.2%, respectively, depending on the inclusion levels of whole wheat [23].

Initial body weight of broilers of all the experimental groups had no significant difference. Weekly weight gain record showed significant differences among all groups except last week. The maximum body weight was obtained in group 'A' control diet while lowest observed in group 'E' in 4th and 5th weeks. The results of the present study were similar to other studies conducted [24-27] who fed diets with different dietary levels of wheat and enzymes to broilers, observed that body weight was significantly high. However, studies indicated that enzyme supplementation did not affect growth performance [28-31].

In the fifth week, results of body growth were non-significant in all groups. The enzymes used effectively in increasing feed conversion ratio which was supplemented with enzymes increasing the nutrient availability [32-34]. The highest dressing percentage observed in group A diet supplemented with control diet and lowest was observed in group D supplemented with 20% wheat and non-supplemented. Some studies conducted their respective study that during grower phase, there was the non-significant effect on dressing percentage supplemented with the enzyme [35]. Results are not in agreement with Wu and Ravindran, [36] except heart and pancreas weight. In this study, there was an increase of weight of liver and gizzard. Moreover, these findings were similar to the one that found increased of gizzard weight [37]. Few of our results are comparable to result of birds fed with diet C with respect to decrease in intestinal weight while controversial to other birds offered diets E and F [37-40]. In group C, there was increased in intestinal weight while in E and F treatments birds, there was decreased in intestinal weight. Results of Wu et al. [40] are disagreement with results of diet C, E, and G which fed with 15%, 20%, and 25% wheat and supplemented with the enzymatic complex.

5. Conclusion
The present study concluded that effect of dietary supplementation of wheat and enzymatic complex in broilers diets has improved weight gain and decreased feed consumption. Similarly, dietary supplementation of wheat and enzymatic complex also increased survival rate and decreased mortality so it can successfully replace corn in poultry diet. Therefore, it is recommended that addition of enzymes with wheat which is cost effective source, could be used for improving the growth performance of modern day broilers.

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