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Effect of Using for Mushroom (Agaricus bisporus) Agricultural by-products and its Adding Enzymes or without in Rations on Some Productive and Economical Traits of Broiler Chicks.

Ali J Hammo*.

Department of Animal Production. College of Agriculture. University of Kufa, Republic of Iraq.

ABSTRACT

The study was conducted in the poultry farm in the Department of Animal Production in the College of Agriculture / University of Kufa for the period from 1/10/2016 to 5/11/2016, to investigate the effect of the use of the white mushroom (Agaricus bisporus) Agricultural by-products and the mixture of enzymes (LABAZYME) in some production and economic characteristics For broiler. 150 broiler chickens (308 Ross) were cultured at an uncivilized age, with an initial weight of 47.7 g per chick, and were incubated in a closed type hall, divided into Pens, each of which was 3 m 2 randomly distributed over 5 treatments and 30 broilers each Treated (10 birds per duplicate) and distributed randomly at the end of the fifth week. The coefficients were as follows: T1: Control., T2: 3% white mushrooms Agricultural by-products without enzyme., T3: 3% white mushrooms Agricultural by-products with Enzyme., T4: 9% white mushrooms Agricultural by-products without enzyme., T5: 9% white mushrooms Agricultural by-products with the enzyme. The results were as follows: There was a significant decrease ($P \leq 0.05$) for both the final live weight, the cumulative weight gain and the total feed intake of the broiler groups presented with the white mushrooms Agricultural by-products. Also, there were no significant differences in the final feed conversion coefficient Experiment other than the T5 chick group ($P \leq 0.05$) showed a significant increase ($P \leq 0.05$) in the values of the final dietary conversion ratio compared to the control treatment (T1). The results of the present study showed no significant differences in the economic figure values of the T2 group compared with the control treatment. Treatment of control, we conclude that the use of white fungus residues resulted in the reduction of most studied traits, although the second treatment (T2) did not differ significantly with the control hatched group.

Keywords: mushroom, agaricus bisporus, enzyme, broiler chicks.

Corresponding author

INTRODUCTION

Third world countries, including Iraq, suffer from a severe shortage of feedstuffs due to the intense competition between humans and poultry for grain consumption, including maize (Al-Mashhadani, 2016).Yellow corn is used in many feed industries such as starch and dextrin (Al-Kassar and Abdul-Abbass, 2009). European countries and America also turn to the manufacture of biofuels (ethanol) from maize to be used as fuel for cars, reducing the quantities of maize exported to countries Consuming them.And therefore the high prices, especially what is imported, in addition to the irregularity of their import, especially if we know that the proportion of their use in bird diets (Abdulrahman et al., 2017) Poultry up to 75%. As a result of this shortfall in the availability of maize as feedstock, the use of substitutes for imported and high-priced materials such as maize will reduce the cost of feed (Al-Hemaidawi, 2016). Especially in the case of the fact that the cost of al-Aqla amounts to 60-70% of the total production mandate (Jadran, 2015). In Iraq, there are many plant-based waste that did not pay adequate attention to the use of imported materials that cost the country a lot of hard currency, Prices and environmental impacts during transport, which negatively affect the value of feed as a result of transport and storage for a long time (Al-Kassar and Al-Hameed, 2007).The availability of significant quantities of white mushroom cultivation, especially in the center of mushroom cultivation in Najaf governorate, a medium that is prepared and fermented according to solid state fermentation technology (Alkaisi et al., 2016) In the exploitation of this product in poultry feed for its benefits of feed and health with the addition of a mixture of enzymes to increase the digestion rate of these wastes and the absence of a study in Iraq shows the effect of replacing white mushrooms Agricultural by-products to replace the yellow maize in the chicken broiler This study was conducted to show that effect Some productive and economic characteristics of meat breeds.

MATERIALS AND METHODS

Field experience:

The research was carried out in the poultry farm located in Animal Production Department at the Faculty of Agriculture / University of Kufa during the period from 1/10/2016 to 5/11/2016 to determine the effect of using the white Agaricus bisporus with or without 0.1% of LABAZYME which contain the protease (2.750 csu), Amylase (5.500 slu) and Cellulase (27.5 fpui) on economic and production traits in broiler.

Experience Plan:

The chicks were fed on two periods, the starter diet during the first three weeks and the finisher diet until the end of the fifth week (Tables 1 and 2).

Table1: Percentage inclusion and calculated composition of diets in starter period.

Ingredients	T1	T2	T3	T4	T5
Corn	60	56	56	49	49
Mushroom agricultural by-products	0	3	3	9	9
Soybean meal (44% CP)	35.5	35.5	35.5	35	35
Oil sunflower	1	2	2	3.5	3.5
Premix[1]	2.5	2.5	2.5	2.5	2.5
Limestone	0.7	0.7	0.7	0.7	0.7
Salt	0.3	0.3	0.3	0.3	0.3
Total	100	100	100	100	100
Calculated composition					

ME(kcal/kg)	2982	2980	2980	2953	2953
CP(%)	22.44	22.50	22.50	22.49	22.49
CP/ ME	132.9	132.4	132.4	131.3	131.3

(1) Use of Premix Jordanian Origin Type Provimi 3110 Contains: 2750 kcal/ kg Representative energy, 10% raw protein, 1.1% fat, 21% calcium, 11.0% phosphorus, 6.5% methionine, 6.5% methionine + Lysine, 4.8% Sodium, 5.4% Chloride, 575000 IU Vitamin A, 201250 IU Vitamin D3, 1380 mg Vitamin E, 138 mg Vitamin K3, 138 mg Vitamin B1, 345 mg Vitamin B, 1840 mg Vitamin B3, 552 mg Vitamin 5 B, 184 mg B vitamins, 46 mg vitamin B9, 1000 micrograms B12, 6900 micrograms peyutin, 14,000 mg choline chloride, 460 mg copper, 2760 mg iron, 3680 mg manganese, 3680 mg zinc, 50 mg iodine, 9.2 mg selenium, 30000 m Vitez mine, 250 mg antioxidants, 250 mg lincomycin, 2400 mg selenomycin) / kg.

Table 2: Percentage inclusion and calculated composition of diets in finisher period.

Ingredients	T1	T2	T3	T4	T5
Corn	60	58	58	56	56
Mushroom agricultural by-products	0	3	3	9	9
Wheat	9	7	7	2	2
Soybean meal (44% CP)	26	26	26	26	26
Oil sunflower	1.5	2.5	2.5	3.5	3.5
Premix[1]	2.5	2.5	2.5	2.5	2.5
Limestone	0.7	0.7	0.7	0.7	0.7
Salt	0.3	0.3	0.3	0.3	0.3
Total	100	100	100	100	100
Calculated composition					
ME(kcal/kg)	3096	3096	3096	3041	3041
CP(%)	19.05	19.03	19.03	19.05	19.05
CP/ ME	162.5	162.7	162.7	159.6	159.6

(1) Use of Premix Jordanian Origin Type Provimi 3110 Contains: 2750 kcal/ kg Representative energy, 10% raw protein, 1.1% fat, 21% calcium, 11.0% phosphorus, 6.5% methionine, 6.5% methionine + Lysine, 4.8% Sodium, 5.4% Chloride, 575000 IU Vitamin A, 201250 IU Vitamin D3, 1380 mg Vitamin E, 138 mg Vitamin K3, 138 mg Vitamin B1, 345 mg Vitamin B, 1840 mg Vitamin B3, 552 mg Vitamin 5 B, 184 mg B vitamins, 46 mg vitamin B9, 1000 micrograms B12, 6900 micrograms peyutin, 14,000 mg choline chloride, 460 mg copper, 2760 mg iron, 3680 mg manganese, 3680 mg zinc, 50 mg iodine, 9.2 mg selenium, 30000 m Vitez mine, 250 mg antioxidants, 250 mg lincomycin, 2400 mg selenomycin) / kg.

Five treatments were used as below:

T1: control.
T2:3% white mushrooms Agricultural by-products without enzyme.
T3: 3% white mushrooms Agricultural by-products with the enzyme.

T4: 9% white mushrooms Agricultural by-products without enzyme.
T5: 9% white mushrooms Agricultural by-products with the enzyme.

Birds management:

150 broiler chicks (Ross 308) were cultured at an uncivilized age, with an initial weight of 47.7 g per chick, and were incubated in a closed type hall, divided into Pens (3 m^2/pen). 30 chicks were distributed over 5 treatments (10 birds per replicate) and the treatments were randomly distributed on the pens until the end of the fifth week. The incubators were used during the first period, while coolers and air ventilators were used to obtain the ideal temperature during the final birdlife stages. Wood shavings was used over the floor with a thickness (7 cm. approx.). The water and feed were provided free of charge Ad-libitum. The characteristics of live body weight, weight gain, feed consumption, feed conversion ratio, and economic figure were studied.

Chemical analysis of mushroom cultivation residues:

The samples were well sampled and tested using an electric mill for analysis. Raw protein, raw fiber, fat, ash and organic matter were estimated at the Central Laboratory of the College of Agriculture, University of Baghdad. All calcium, phosphorus and potassium were estimated in the laboratory of the soil science department in our college. Department of Animal Production - Faculty of Agriculture - University of Kufa - Republic of Iraq Calculated the percentage of carbohydrates calculated.

Statistical analysis:

The data was analyzed using the Completely Randomized Design (CRD) and significant differences between the Duncan (1955) and the statistical SAS, (2012) statistical analysis were analyzed.

RESULTS

Chemical Analysis of Mushroom Cultivation Residues:

Table (3) showed the results of the chemical analysis of white fungus residues for dry matter, organic matter, crude protein, raw fiber, ether extract, ash, calcium, phosphorus and potassium. The energy represented is described (Janssen, 1989).

Table 3: Approximate gross composition of white Mushroom Agricultural by-products (%).

Dry matter	90.7
Organic matter	94.87
Crude protein	14.19
Crude fiber	6.23
Ether extract	0.15
Ash	4.15
Nitrogen free extract	75.28
Calcium	6.183
Phosphor	0.019
Potassium	1.075
Metabolism energy (Kcal/kg)	1471

Attributes studied:

Live body weight: Table (4) The results of week 3 showed that the treatment of T5 was the highest weight between the treatments followed by the treatment T1 and T2, while T3 recorded the lowest rate between the transactions, and we see from the results of the fifth week a significant decrease ($P \le 0.05$) (T1). The white mushrooms Agricultural by-products were not significantly different with the addition of white mushrooms Agricultural by-products with enzymes.

Table 4: Effect of feed supplementation on live body weight (g) of broiler chicks during 5 weeks .

			Age/weeks		
Treatments	1	2	3	4	5
T1	198±5.44 b	465±4.04 ab	980±5.00 ab	1593±12.01 a	2320±15.27 a
T2	205±0.26 ab	442±18.18 b	980±8.66 ab	1535±8.66 bc	2137±12.99 b
T3	200±1.58 ab	460±13.27 ab	960±14.40 b	1525±14.43 c	2100±46.18 b
T4	202±2.83 ab	483±2.89 a	975±5.77 ab	1550±5.77 bc	2145±54.84 b
T5	207±1.90 a	487±2.02 a	1000±8.66 a	1565±20.20 ab	2047±27.42 b

T1: Control., T2: 3% white mushrooms Agricultural by-products without enzyme., T3: 3% white mushrooms Agricultural by-products with Enzyme., T4: 9% white mushrooms Agricultural by-products without enzyme., T5: 9% white mushrooms Agricultural by-products with the enzyme.

Weight gain: Table 5 shows the rate of weekly and cumulative increase in weight. As we observe from the results of the third week, T2 obtained the highest increase in weight recorded 537 g while T4 recorded the lowest rate of increase recorded 492 g, while T3 and T5 did not differ significantly compared with treatment the control. While the results of the fifth week showed a significant decrease in the cumulative rate of increase of all experimental factors compared to control treatment.

Table 5: Effect of feed supplementation on weight gain (g) of broiler chicks during 5 weeks

			Age/weeks			
Treatments	1	2	3	4	5	1-5
T1	153±5.51 b	267±3.05 ab	515±8.73 ab	613±7.26 a	727±24.03 a	2275±15.27 a
T2	160±11.54 ab	238±18.47 c	537±26.84 a	555±28.86 b	603±14.33 b	2092±12.99 b
T3	155±1.45 ab	260±11.54 abc	500±1.15 ab	565±28.86 b	575±31.75 b	2055±46.18 b
T4	158±2.88 ab	281±5.48 a	492±2.89 b	575±20.09 b	595±49.07 b	2100±54.84 b
T5	163±1.73 A	280±1.11 a	512±6.46 ab	565±11.54 b	483±47.63 c	2002±27.42 b

T1: Control., T2: 3% white mushrooms Agricultural by-products without enzyme., T3: 3% white mushrooms Agricultural by-products with Enzyme., T4: 9% white mushrooms Agricultural by-products without enzyme., T5: 9% white mushrooms Agricultural by-products with the enzyme.

Feed consumption: Table (6) shows the average weekly and cumulative consumption of fodder for broiler chickens, noting that there is no significant difference in feed consumption rate for the third week of all experimental treatments compared to T1. Results of cumulative feed consumption showed a significant decrease in T2, T3 and T5 compared to T1, while T4 did not differ significantly with T1.

Table 6: Effect of feed supplementation on feed intake (g) of broiler chicks during 5 weeks.

			Age/weeks			
Treatments	1	2	3	4	5	1-5
T1	158±0.33 ab	308±4.40 cd	638±15.89	972±40.44 ab	1428±51.01 a	3504±5.78 a
T2	157±0.88 ab	313±3.33 bcd	662±26.19	915±2.88 b	1245±14.43 bc	3293±13.38 b
T3	155±0.57 b	300±10.0 d	625±2.88	985±20.20 ab	1158±52.46 c	3224±27.38 b
T4	158±0.88 ab	330±5.77 abc	677±33.33	980±31.64 ab	1274±58.75 bc	3419±119.67 ab
T5	159±1.20 a	352±10.13 a	680±5.77	1042±26.19 a	1141±98.92 c	3375±110.74 b

T1: Control., T2: 3% white mushrooms Agricultural by-products without enzyme., T3: 3% white mushrooms Agricultural by-products with Enzyme., T4: 9% white mushrooms Agricultural by-products without enzyme., T5: 9% white mushrooms Agricultural by-products with the enzyme.

Feed Conversion Ratio: Table (7) shows the weekly and cumulative feed conversion ratio of broiler chickens. The results of the third week showed no significant differences in T1, T2 and T3. We also observed a significant increase in T4 and T5 compared with control treatment. The cumulative feed conversion coefficient recorded no significant differences for all experimental factors except T5, which recorded a significant increase compared with control treatment.

Table 7: Effect of feed supplementation on feed conversion ratio of broiler chicks during 5 weeks.

			Age/weeks			
Treatments	1	2	3	4	5	1-5
T1	1.03±0.03	1.15±0.02 c	1.24±0.01 b	1.58±0.05 c	1.67±0.06 c	1.54±0.01 b
T2	0.98±0.01	1.23±0.03 ab	1.23±0.01 b	1.65±0.01 bc	2.06±0.03 c	1.57±0.03 b
T3	0.99±0.01	1.16±0.02 c	1.25±0.01 b	1.75±0.12 abc	2.02±0.04 c	1.57±0.03 b
T4	1.00±0.02	1.18±0.04 bc	1.37±0.06 a	1.70±0.06 bc	2.15±0.08 bc	1.62±0.02 b
T5	0.98±0.01	1.26±0.03 a	1.33±0.05 a	1.84±0.07 a	2.38±0.06 a	1.68±0.04 a

T1: Control., T2: 3% white mushrooms Agricultural by-products without enzyme., T3: 3% white mushrooms Agricultural by-products with Enzyme., T4: 9% white mushrooms Agricultural by-products without enzyme., T5: 9% white mushrooms Agricultural by-products with the enzyme.

Economic figure: Table (8) shows the values of the economic figure, noting that there is no significant difference between T2 and T1.

Table 8: Effect of feed supplementation on economic figure of broiler chicks at the end of the fifth week.

T1	341±15.12 a
T2	296±7.34 ab
T3	262±28.01

	bc	
T4	279±24.28 bc	
T5	235±16.28 d	

T1: Control., T2: 3% white mushrooms Agricultural by-products without enzyme., T3: 3% white mushrooms Agricultural by-products with Enzyme., T4: 9% white mushrooms Agricultural by-products without enzyme., T5: 9% white mushrooms Agricultural by-products with the enzyme.

DISCUSSION

The results of the mean body weight and weight increase showed the possibility of substituting white fungus residues up to the third week for all replacement factors. The reason for the decrease in final body weight and the cumulative weight increase was due to the high replacement rate, which resulted in a high percentage of fiber in the diet, And the increase in the weight of the birds. The reason for the decrease in the final live weight and the cumulative increase in the replacement factors for the last two weeks is due to increased intake of feed by the wedding, which led to an increase in the amount of fibers eaten by the birds. To negatively affect the growth rate. The results of our current study were similar to those found by Fard et al., (2014) from low vivo and significant cumulative weight gain when adding Mushroom wastes to broiler chicks by 2%.

The decrease in feed consumption may be due to the increase in the size of the diet due to the use of fungus residues, which has a high fiber ratio, as shown in Table (2), with limited digestion of the digestive system of the bird, reducing the amount of feed consumed, which was reflected in the amount of nutrients eaten by the bird, The results of feed consumption were similar with those of Ebenebe et al., (2011) who indicated a significant reduction in daily feed consumption when using Mushroom (Termitomyces microcarpus) meal in meat broiler diets. The results obtained by Giannenas et al., (2010) who showed no significant differences in the consumption of fodder when adding white mushrooms to meat broilers.

The results of the feed conversion coefficient showed that there were no significant differences for all experimental treatments except for the fifth treatment. This may be because of the low consumption of fodder, which was also offset by a parallel decrease in the weight increase, which resulted in no significant differences in the feed conversion ratio. With a significant effect on the feed conversion ratio. This finding was agreed with past studies of using the Pleurotus sajorcaju mushroom in broiler diets which showed no significant differences between the coefficients (Azevedo et al., 2009 and Mazaheri et al. 2014) and also absence of significant differences in the coefficient Feed conversion when using Mushroom Waste (Agaricus bisporus) in broiler diets.

The results of the addition of enzymes to the diets did not differ compared to the non-addition in most studied traits. This may be due to the high percentage of fiber in the feedings as a result of the addition of white fungus residues and therefore the amount of the added enzyme was insufficient to increase the digestion coefficient.

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