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EFFECT OF SOME FEED MIXTURES (PREMIX) IN SOME PRODUCTIVE TRAITS OF BROILERS

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Abstract

The aim of this experiment was to evaluate the replacement of pre-prepared and locally available Premix of pre-prepared Premix imported and used in the production performance of broilers. This experiment was conducted at the Poultry Research Station of Karbala Agriculture Directorate, Karbala Governorate from 17/9/2016 to 2/11/2016. A total of 1200 unsexed chick broilers, one day, 42 g. The chick were randomized distributed to 4 treatments with 300 broilers per treatment. Each treatment included three replicates (100 chick per replicate). Experimental transactions were: T1: a control treatment, the birds were fed on a diet containing an imported Jordanian premix. T2: Second treatment: the birds were fed on a diet containing locally produced premix and the material bearing limestone from its source is Samawah. T3: Third treatment: the birds were fed on a diet containing locally produced Premix and the limestone bearing from Najaf. T4: The fourth treatment: the birds were fed on a diet containing Premix a local factory and the bearing limestone from the mountains of Arbil. The results indicated that the local pre-blended mixture showed significant improvement ($P<0.05$) in body weight, weight gain, feed consumption and feed conversion rate.

Key words: Premix, productive traits, broilers.

Introduction

The great development that has occurred in the field of poultry industry has led to an increase in the demand for animal protein concentrates in the composition of poultry diets, as a result of higher prices resulting in increased feeding costs, make nutritionists use different alternative sources such as plant protein concentrates and premixes (Aboud, 2009). Several companies specializing in the preparation of Premixes, such as Germany's BASF (2005) and Swiss's Zagro (2002), that all pre-preparation mixtures need two types of materials, the first is the target represented by the active substances (amino acids, vitamins and minerals), the second is the carriers for those active substances, the carrier material has several targets, which are physiological for the purpose of increasing the size of the mixture to ensure its homogeneity and distribution to the food and the second chemical as a food that benefits the bird (Al-Kassar, 2006). The addition of protein concentrates in the diet recommended by the manufacturers will equip the diet with a good quality protein, at the same time it works to provides the basic needs of vitamins and minerals in addition to providing essential amino acids such as methionine, lysine and mineral elements such as calcium and phosphorus (Al-Athari, 2002). Abdul-Abbas *et al.,* (2002) observed a significant increase in the weight of birds fed to locally produced plant protein compared with those fed on imported protein, and a significant increase in the weight increase of birds at the age of 8 weeks in favor of the local protein center when compared to the imported protein. The current study aims at the importance of the use of feed mixtures in some of the productive characteristics of broilers.

Materials and Methods

This experiment was conducted at the Poultry Research Station of Karbala Agriculture Directorate, Karbala Governorate, from 17/9/2016 to 29/10/2016. A total of 1200 unsexed chick broilers, one day, 42g. The chick were randomized distributed to 4 treatments with

300 broilers per treatment. Each treatment included three replicates (100 chick per replicate). Experimental transactions were: T1: a control treatment, the birds were fed on a diet containing an imported Jordanian premix. T2: Second treatment: the birds were fed on a diet containing locally produced premix and the material bearing limestone from its source is Samawah. T3: Third treatment: the birds were fed on a diet containing locally produced Premix and the limestone bearing from Najaf. T4: The fourth treatment: the birds were fed on a diet containing Premix a local factory and the bearing limestone from the mountains of Arbil. Table 1. shows the chemical content and composition of mixtures used in the experiment. The chicks were fed by starter for 1-21 days and Grower for 22-42 days and were calculated according to Table 2. Provided for all the requirements of rearing such as litters, lighting, ventilation, heating, feeders. The birds also received the necessary health care and vaccines, Water and feed were ad libitum provided throughout the experiment.

The studied production characteristics are the weekly mean weight, weekly weight gain, weekly feed consumption and feed conversion.

Completely Randomized Design (CRD) was used to study the effect of different coefficients on the studied traits, comparison of the mean differences between the means of the Duncan (1955) multiples test under a significant level of 0.05 and 0.01, SAS (2001) was used in statistical analysis.

Table 1: Content and chemical composition of mixtures used in the experiment.

The pre-banned mixture is imported provime type		The pre-blocked mixture is the bearing material (limestone)	
Chemical analysis			
Crude protein	16%	Crude protein	16%
Calcium	12%	Calcium	13.4%
Methionine	8.7%	Methionine (3)	9.6%
Met+ Cys	8.7%	Met+ Cys	9.6%
Lysine	10%	Lysine	10.10%
Crude Fiber	1%	Crude Fiber	1%
Crude fat	2%	Crude fat	2%
Phosphorus	13%	Phosphorus	14.3%
Metabolism energy	900 Kal/cal	Metabolism energy	900 Kal/cal
Sodium	4.8%	Sodium	4.8%
Chloride	6%	Chloride	6%
Content 1 kg of Premix			
Vit A	500000 IU	Vit A (1)	480000 IU
Vit E	1200 mg	Vit E	3000 mg
Vit D3	120000 IU	Vit D3	192000 IU
Vit K3	120 mg	Vit K3	132 mg
Vit B1	120 mg	Vit B1	132 mg
Vit B2	300 mg	Vit B2	352 mg
Vit B6	160 mg	Vit B6	216 mg
Vit B12	1.6 mg	Vit B12	640 mcg
Folic Acid	40 mg	Folic Acid	80 mg
Pantothenic	480 mg	Pantothenic	600 mg
Biotin	6 mg	Biotin	8 mg
Cholin Chloride	20000 mg	Cholin Chloride	20000 mg
Nicotinamide	1600 mg	Nicotinamide	2400 mg
Vitamin C	4000 mg	Vitamin C	4500mg
Manganese	3200 mg	Manganese	3500 mg
Zinc	3200 mg	Zinc (2)	3500 mg
Iron	2400 mg	Iron	2600 mg
Iodine	52 mg	Iodine	52 mg
Copper	400 mg	Copper	430 mg
Selenium	9 mg	Selenium	12 mg
Antioxidant	250 mg	Antioxidant	200 mg

Results and Discussion

The results indicate in Table 3 that there were no significant differences in the body weight rates of broilers during the ages (1-7 days and 8-14 days), these results were agreed with the results obtained by Abdel-Abbas (2006), While noting that there were no significant differences in live body weight of broilers, which was fed on diets the local protein replaced by the imported animal protein during the 4-6 weeks of age. A significant ($P<0.05$) observed in T4 compared with the rest treatments in the body weight during the period (15-21) days followed by the treatment T2 and T3the treatment, while the control treatment gave the lowest live weight in this comparison, the results also showed a significant difference ($P<0.05$) for the T4 treatment on the other experimental parameters during the period (22-28) days followed by the direct treatment T2 and T3 then treatment while the control treatment gave the lowest live weight, at the age of (29-35) days, treatment T4 continued to be superior to T3 and T1, but did not differ significantly from the T2 treatment in the live body weights of the birds. at the final body weight were observed a significant superiority ($P<0.05$) for the fourth treatment (T4) on the rest of the experiment and recorded the highest value of 2544.10 g / bird followed by the order of the third treatment (T3) and the second treatment (T2).

The decrease in the weight of birds in T2 and T3 in the current study may be due to the increase in salts in limestone, which is the carrier

in the preparation of Premix, especially chlorine and magnesium, which have adversely affected the availability of vitamins and minerals available to birds. The superiority of locally produced mixtures on the imported mixture (control treatment) may be due to the fact that the domestically produced premix has covered the needs of birds of all minerals, vitamins and amino acids necessary for the growth of birds and enabled them to express a better biological performance when compared with the importer. Transport and storage as well as loss due to the presence of choline (Workel, 1998).

Table 4 shows that there are no significant differences in the weight gain during periods (1-7, 8-14) days. The fourth treatment (T4) was significant increased (P<0.05) to the control treatment (T1) at the age of (15-21) days, this treatment did not differ from T2 and T2 The T1 control treatment did not differ from T2 and T3 in the same trait at this age (15-21) days. At the age of 22-28 days, T4 treatment continued to be superior to T1 and to T3, but did not differ significantly with T2 treatment. T2 was not differ with T3. In the last week of the birds (36-42) days, both T3 and T4 showed significant increases in both T1 and T2, giving them a higher weight gain of 635.03 g and 649.73 g for the above two treatments with values of 465.76 g for T1 and 551.99 g for T2 treatment. The T4 treatment with the T3 treatment was not significant in this trait. In the general average of this status the fourth treatment (T4) showed a significant increase (P<0.05) on all experimental parameters, with a mean increase of 416.96 g followed by the third treatment (T3), 406.10 g, then the second treatment (T2) and 400.18 g, T1) showed the lowest weight increase in this comparison and reached 375.01 (g). The fourth treatment, which feeds on Premix, may be attributed to limestone from the mountains of Erbil governorate, which is free from impurities, as well as its low salt content. The superiority of the local mixtures to the importer may be attributed to the readiness of the nutrients for the birds and the local mixture, due to transport and storage.

Table 2: Feed materials proportion in starter and grower, chemical composition of the diet.

Feeding materials	Control		Treatment	
	Starter	Grower	Starter	Grower
Maize	51	57.2	51	57.2
Soybean Meal[1]	35	28	35	28
Premixes[2]	2.5	2.5	0	0
Premixes[3]	0	0	2.5	2.5
Limestone	0.5	0.5	0.5	0.5
Di-Calcium Phosphate	0.7	0.5	0.7	0.5
Oil	0.2	1.2	0.2	1.2
DDGS 35%	10	10	10	10
Anti-toxin	0.05	0.05	0.05	0.05
Antifungal	0.05	0.05	0.05	0.05
Total	100	100	100	100
Calculated Chemical Analysis[4]				
Crude protein%	23	20.1	23	20.1
Metabolized energy kcal/kg	2950	3120	2950	3120
Methionine%	0.51	0.48	0.51	0.48
Methionine and cysteine%	0.90	0.80	0.90	0.80
Lysine%	1.15	1	1.15	1
Calcium%	1	0.90	1	0.90
Available phosphorus%	0.43	0.40	0.43	0.40
crude fiber%	3	3.5	3	3.5
Fat%	2.8	3	2.8	3

1. Argentinean soybean source, containing 42% crude protein and energy represented 2230 kcal / kg.

2. Premix type Provime, each 1 kg of it contains: 16%, crude protein 16%, metabolized energy 900 kcal / kg, 10%lysine, 8.7%methionine, 8.70%methionine and cysteine, 2% fat, 1% crude fiber, 12% calcium, 13% phosphorus, di-calcium phosphate contained 21.8% calcium and 18% phosphorus.

3. Premix local type, each 1 kg of it contains: 16%, crude protein 16%, metabolized energy 900 kcal / kg, 10%lysine, 8.7%methionine, 8.70%methionine and cysteine, 2% fat, 1% crude fiber, 12% calcium, 13% phosphorus, di-calcium phosphate contained 21.8% calcium and 18% phosphorus.

4. Calculated chemical composition according to N.R.C (1994).

Table 5 indicates that there is no significant difference in the feed consumption rates of birds between the various treatments during the age of birds for periods (1-7, 8-14). At the age of (15-21) days, there was a significant superiority (P<0.05) of the second (T2) and the fourth (T4), with values of 684.10 and 689 g / birds on the T1 and T3, The lowest (636.72, 632.9) g / birds, respectively. The results of the period (22-28) days showed a significant increase (P<0.05) in feed consumption (0.05 P)) for the fourth treatment (T4) followed by the third treatment (T3) and the treatment T2 compared with the control treatment T1. T4, T3 and T2 not differ between them. The data for the period (29-35) days indicate a significant increase (P<0.05) in feed consumption for the first transactions (T1) and the fourth (T4), which recorded consumption rates of 935.97 and 945.33 g / bird compared to the second treatment (924.45 g / bird), which showed a significant superiority on T3 treatment, which recorded the lowest feed consumption rates at the age of 908.56 g / bird. At the last week of the broiler age (36-42) days, the third treatments (T3) and the fourth (T4) showed a significant increase (P<0.05). The feed consumption rate was 1114.66 and 1119.27 g / fed on the second

Table 3: Effect of using different sources of limestone on body weight (mean± S.E.) during rearing period (1-42) days.

Treatment	Age (Days)						
	1	7	14	21	28	35	42
T1	0.17±42.59	0.84±128.58	0.75±340.99	7.43±780.30B	4.75±1305.29D	4.37±1826.9C	7.83±2292.66D
T2	0.25±41.89	2.06±130.33	3.16±343.53	1.05±788.65B	3.16±1366.05B	6.86±1891.01A	5.13±2443C
T3	0.65±42.28	1.94±130.35	3.39±339.78	3.24±782.40B	1.27±1344.70C	0.66±1843.90B	4.99±2478.93B
T4	0.69±42.34	2.21±129.46	2.48±340.12	5.65±801.71A	8.40±1391.60A	5.67±1894.73A	4.18±2544.10A
Sig.	N.S	N.S	N.S	*	*	*	*

T1: a control treatment, the birds were fed on a diet containing an imported Jordanian premix. **T2:** Second treatment: the birds were fed on a diet containing locally produced premix and the material bearing limestone from its source is Samawah. **T3:** Third treatment: the birds were fed on a diet containing locally produced Premix and the limestone bearing from Najaf. **T4:** The fourth treatment: the birds were fed on a diet containing Premix a local factory and the bearing limestone from the mountains of Arbil. N.S no significant differences.*The different letters within the same column indicate significant differences between the totals at the probability level of 0.05.

Table 4: Effect of using different sources of limestone on weight gain (mean± S.E.) during rearing period (1-42) days.

Treatment	Age (Days)						General Average 1-42 days
	1-7	14-8	15-21	22-28	29-35	36-42	
T1	0.91±85.99	1.27±212.41	8.07±439.31B	8.38±524.99C	6.76±521.61A	8.28±465.76C	1.31±345.01D
T2	1.96±88.44	3.66±213.20	4.08±445.12AB	2.13±577.40AB	4.67±524.96A	1.75±551.99B	0.82±400.18C
T3	1.73±88.07	5.33±209.43	5.89±442.62AB	4.25±562.30B	0.60±499.20B	5.37±635.03A	0.72±406.10B
T4	2.32±87.12	4.54±210.66	6.89±461.59A	3.36±589.89A	2.73±503.13B	1.82±649.73A	0.73±416.96A
Sig.	N.S	N.S	*	*	*	*	*

T1: a control treatment, the birds were fed on a diet containing an imported Jordanian premix. **T2:** Second treatment: the birds were fed on a diet containing locally produced premix and the material bearing limestone from its source is Samawah. **T3:** Third treatment: the birds were fed on a diet containing locally produced Premix and the limestone bearing from Najaf. **T4:** The fourth treatment: the birds were fed on a diet containing Premix a local factory and the bearing limestone from the mountains of Arbil. N.S no significant differences.*The different letters within the same column indicate significant differences between the totals at the probability level of 0.05.

treatments (T2). (T1) which recorded values of 1045.19 g and 1033.72 g respectively. At the general rate of the experiment, we observed a significant superiority (P<0.05) of the fourth treatment (T4) (0.05 P)) on the rest of the experiment, as it recorded 675.13 g / birds while T3, T2, and T1 recorded an estimated feed consumption rate of 657.70,659.63,648.48 g respectively.

It may be due to the moral superiority that was obtained for the birds of the fourth treatment is to increase the body weight of the birds of this treatment, which led to the consumption of larger amounts of fodder and this is normal.

Table 6 indicates that there is no significant difference in the feed conversion of different birds during the period (1-7, 8-14) days of the experiment. The data for the age range (15-21) days showed a significant superiority (P<0.05) in the feed conversion coefficient of the second treatment birds on the other experimental parameters. The value of 1.54 g diet / g weight was 1.42 and 1.48 g diet / g weight respectively. The first treatment did not differ significantly with the second treatment, and the third and fourth treatments did not differ between them at this age. At the age of (22-28) days, the first treatment significantly exceeded (P<0.05) the other experimental treatments in recording the value of the food conversion factor of 1.61 g diet/ g weight, while the T2, T3 and T4 recorded values of low conversion coefficient of 1.51, 1.56 and1.50 g diet/ g weight respectively. The results of the period (29-35) days indicate a significant superiority (P<0.05) for the third and fourth treatments (1.82 and 1.86g diet/g weight respectively on the second treatment, which recorded the lowest conversion coefficient of food and reached 1.76g diet/g weight. The first treatment did not differ significantly with the third treatment, the treatment and the fourth. During the last week of the experiment (36-42 days) the treatment of control (T1) continued with the highest value of the food conversion coefficient (2.21g diet/g weight) while the third and fourth treated birds gave low values to this characteristic and were estimated at 1.75 and 1.72g diet/g weight Respectively, while the second treatment (T2) with a mean value of dietary conversion coefficients (1.89g/g) in this comparison, In the general average, the first treatment recorded the highest value of the food conversion coefficient (1.65g diet/g weight), while the

Table 5: Effect of using different sources of limestone on feed consumption (mean± S.E.) during rearing period (1-42) days.

Treatment	Age (Days)						General Ave--rage 1-42 days
	1-7	14-8	15-21	22-28	29-35	36-42	
T1	0.81±119.36	3.99±308.57	2.47±636.72B	2.50±847.17B	2.33±945.33A	31.23±1033.72B	5.45±648.48B
T2	2.20±121.36	16.46±302.14	1.35±689.580A	2.33±875.03A	1.84±924.49B	5.00±1045.19B	3.60±659.63B
T3	2.48±116.84	293.40 ±7.92	10.06±632.91B	6.86±879.83A	4.50±908.56C	1.59±1114.66A	1.43±657.70B
T4	2.27±121.92	8.00±303.77	4.76±684.10A	6.18±885.81A	6.58±935.97AB	6.58±1119.27A	0.75±675.13A
Sig.	N.S	N.S	*	*	*	*	*

T1: a control treatment, the birds were fed on a diet containing an imported Jordanian premix. **T2:** Second treatment: the birds were fed on a diet containing locally produced premix and the material bearing limestone from its source is Samawah. **T3:** Third treatment: the birds were fed on a diet containing locally produced Premix and the limestone bearing from Najaf. **T4:** The fourth treatment: the birds were fed on a diet containing Premix a local factory and the bearing limestone from the mountains of Arbil. N.S no significant differences.*The different letters within the same column indicate significant differences between the totals at the probability level of 0.05.

Table 5: Effect of using different sources of limestone on feed conversion (mean± S.E.) during rearing period (1-42) days.

Treatment	Age (Days)						General Ave--rage 1-42 days
	1-7	14-8	15-21	22-28	29-35	36-42	
T1	0.01±1.38	0.01±1.45	0.02±1.44AB	0.02±1.61A	0.02±1.81AB	0.07±2.21A	0.01±1.65A
T2	0.02±1.37	0.06±1.41	0.01±1.54A	0.00±1.51C	0.01±1.76B	0.00±1.89B	0.01±1.58B
T3	0.02±1.32	0.01±1.40	0.01±1.42B	0.00±1.56B	0.00±1.82A	0.01±1.75C	0.00±1.55B
T4	0.02±1.39	0.01±1.44	0.02±1.48B	0.00±1.50C	0.00±1.86A	0.00±1.72C	0.00±1.56B
Sig.	N.S	N.S	*	*	*	*	*

T1: a control treatment, the birds were fed on a diet containing an imported Jordanian premix. **T2:** Second treatment: the birds were fed on a diet containing locally produced premix and the material bearing limestone from its source is Samawah. **T3:** Third treatment: the birds were fed on a diet containing locally produced Premix and the limestone bearing from Najaf. **T4:** The fourth treatment: the birds were fed on a diet containing Premix a local factory and the bearing limestone from the mountains of Arbil. N.S no significant differences.*The different letters within the same column indicate significant differences between the totals at the probability level of 0.05.

rest of the experimental parameters (T2, T3 and T4) showed a dietary conversion factor (1.65, 1.56, 1.55g diet/g weight).

The significant improvement in the food conversion factor of the birds may be due to the pre-prepared local mixture, compared with the importer, to its efficiency and to ensure its components and content of amino acids, vitamins and rare minerals, while the containers and proportions of the importer's ingredients did not comply with the specifications prescribed in the label by the companies producing them (Al-Athari, 2002).

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