Al-Qadisiyah Journal For Agriculture Sciences (QJAS)
ISSN : 2618-1479 Vol.12, Issue. 1 ,(2022), pp. 93-97
https://jouagr.qu.edu.iq/

The Growth Parameters Response of Broiler Chicks Fed Partial replacement of Rice Bran for the Yellow Corn

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Received : 13/4/2022
Acceptance : 26/4/2022
Available online: 1/6/2022

Abstract. Not long ago, Researchers try to find a suitable alternative source from the cereal by-product instead of yellow corn. Today there is a global shortage in cereal production, so to archive goals to make less dependent on regular cereals which used in human feeding we have to examine using unusual feed staff like Rice bran. Our experiment was carried out in poultry farm, Department of Animal Production, Faculty of Agriculture/ University of Kufa to explore the broiler productive performance of Rose 308 fed rice bran diets with partly replacement of Yellow Corn. 225 chicks were used in our study by distributing them into 5 treatments as trails: (T1) control (50% yellow corn), T2, T3 substituted 5, 7.5 % of raw rice bran by yellow corn respectively, T4, T5 substituted 5, 7.5 % of Rice bran (treated with Ascorbic acid) by yellow corn. Our results show that: No significant differences in marketing live body weight, body weight gain, accumulative feed consumption and accumulative feed conversion ratio for experimental groups fed diet supplementing by Raw Rice bran or preserved by Ascorbic acid with control group, which main feeding broiler by rice bran diets has enhanced growth performance in broiler chicken. Our indication is substitution of 5 or 7.5 % rice bran with yellow corn had no bad effect on broiler performance.

Keywords. Rice bran, Ascorbic Acid, Performance, Ross 308.

I. INTRODUCTION

The raw materials used in human feeding should be abridged in poultry production schemes. The highest cereal used in poultry production systems is Corn, therefore, the using of rice bran as a substitute by-product according to availability and their nutritional impacts to expand their assortment increases the flexibility of systems, avoiding necessity of materials that significantly alter their prices. Nevertheless, rice bran can be an incomplete substitution for corn because its nutritive features are similar to those of corn (1), but it is more consist of Cysteine and lysine (4.8 – 5.4) % with Threonine (3.8-4.2) % (2). Rice bran consists of high protein levels of around 13%, fatty acids of13%,and Metabolizable energy 2980 Kcal/kg (3), with a low starch portion compared to corn that could offer a way of decreasing risk of Mycotoxin infection, so this low-cost of energy source from agro-industrial by-product could use in the diet of chickens (4,5,6,7,8). Rice bran is rich foundation of oryzanols, tocopherols, tocotrienols, and phytosterols, these greatly nutritive composite as a micronutrients include an antioxidant like vitamin E (9). The replacement of rice bran at 25 or 50% instead of yellow corn, may reduce the digestibility of the diet and birds growth (1,10), because of high content of fiber, which reduced the use of 12.5% rice bran in a ration of broiler diets (11). To reduce the fiber content through chemical treatment programs that lead to use it in laying hens feeding up to 25 or 50% of rice bran by yellow corn without any adverse effects on egg quality or egg production (12,13). If Rice bran is treated with acetic acid should be replaced by 10 % of corn with no affecting on broiler performance (8), When the substitution rate is up to 20% it will reduce production performance during in same feeding period. Partly replacement of raw or treated rice bran with ascorbic acid instead of corn without any significant effect on meat quality of broiler (14,15). The overfeeding of rice bran showed no adverse effect on body weight of broiler in partial substitutions (16,17), but at a higher alteration levels could sensory of productive characteristics especially of feed conception (18). This study has focused on the substitution of raw or treated Rice bran with ascorbic acid instead of corn during total production period of broiler.

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II. LL. MATERIALS AND METHODS

Table 1. The content of the experimental diets %.

Ingredient %	Diets					
	Starter(1-21day)			Finisher(22-35day)		
	T1	T2,T4	T3,T5	T1	T2,T4	T3,T5
Yellow Corn	49.7	45	42.5	50	45	42.2
Rice bran	0	5	7.5	0	5	7.5
Wheat	10	10	10	13	13	13
Wheat bran	0.6	0.25	0.45	2.95	2.7	2.5
Soybean meal (48%)	33.5	33.35	33	26	26	26
Premix [a]	2.5	2.5	2.5	2.5	2.5	2.5
Limestone	0.5	0.5	0.5	0.5	0.5	0.5
Salt	0.2	0.2	0.2	0.2	0.2	0.2
dicalcium Phosphate	1.6	1.6	1.6	1.6	1.6	1.6
Vegetable oil	1.25	1.5	1.65	4.2	3.25	4.4
Crude protein %	23.1	23.1	23.1	20.25	20.4	20.4
Energy (Kcal ME / kg)	3003	3002	3001	3154	3151	3154
Calcium %	0.93	0.93	0.93	0.88	0.88	0.88
Available phosphorus %	0.46	0.46	0.46	0.43	0.43	0.43
Cysteine +Methionine %	0.86	0.86	0.86	0.76	0.76	0.76
Crude Fiber %	3.88	4.06	4.18	3.75	3.95	4.04

[a.] One kilogram of premix contained: 2200 Kcal/kg Metabolizable Energy, Protein45%, Fiber 3%, Fat 8%, Phosphorus (av) 0.12%, calcium 6%, Cystine +methionine 2.5%, Lysine3%, methionine 2% Vitamin A 130.000 IU, Vitamin D3 30.000 IU, Vitamin E 500 mg, Vitamin K 40 mg, B1 30 mg, B2 75mg,B6 60 mg, Pantothenic acid 120 mg, Folic acid 15 mg, Niacin 400 mg, biotin1500 mg, choline 1.7%, Na 1.5 %, Fe 450 mg, Cu 70%, Zn 600 mg, potassium iodine 5 mg, cobalt 1 mg and Selenium 1 mg.

Our research was conducted at fowl farm, Department of Animal Production, Faculty of Agriculture, University of Kufa, for a period of 5 weeks from 2nd/12/2018 to 5th/1/2019. Rice bran was collected from Iraqi market by using Anbar Rice and treated with pure ascorbic acid powder in conc. 2% by soaking it in water solution (2 water \1 Rice bran) for 24 hours then operating it on concrete ground for sun dried according to Abdul-Abass and Almrsomi (10). Our experiment was designed by a completely randomized design (CRD) by using a 225 broiler Ross 308 chicks (1day old and 38 g initial weight) carried from Babylon (Al-Anwar Hatchery). Chicks were distributed randomly to 5 treatments (45 chicks per treatment with 3 replicates), as follows: The treatments were as follows: T1 was a control collection (50% yellow corn + 0% Rice bran), T2 was replaced by 5% of Raw Rice bran by yellow corn, T3 was replaced of 7.5% of Raw Rice bran by yellow corn, T4 was replaced by 5% of acid treated Rice bran by yellow corn, T5 was replaced by 7.5% of acid treated Rice bran by yellow corn. The chicks were distributed to 15 Pens in size 200 × 150 cm per pen in floor cages, each replicate contents 15 birds which providing an artificial lighting (23 hours \day) for a period of five experimental weeks. Chicks were fed in the first three weeks of age (1 - 21 days) on starter diet (23.1% protein and 3000 Kcal ME\kg), whereas during (22 - 35 days) with finisher diet (20.4 % crude protein and 3150 Kcal ME\kg) Table 1. A mixture of minerals and Vitamins were added to support the chicken diets requirements accordance to broiler Ross 308 management guide (2018) (19). Water and Diets were presented ad libitum. Live body weights and feed consumption were recorded at 7, 14, 21, 28 and 35 days of age, but mortality was recorded daily, then body weight gain and feed conversion ratio were calculated weekly. Data collected from our study were tested for significance by one-way ANOVA by GLM procedures of SAS (2012) (20). The Differences among treatments means were tested by Duncan's multiple collection test (21). The nutrient composition of testing diets is presented in Table 1; diets were formulated according to N.R.C (3). The nutrient composition illustrates that the T1 diet (control) has less crude fiber content than the varieties of other experimental diets. However, crude protein, Metabolizable Energy, Calcium, Available phosphorus and cysteine +Methionine were equals.

III. RESULTS

The mean of live body weight (LBW) of chicks during the experimental period showed no significant differences in live body weight, in a weeks of experiment, except T4 group recorded the highest body weight during 21 days of Age (3 weeks), while No significant difference was found between others experimental treatments with control as shown in figure 1.

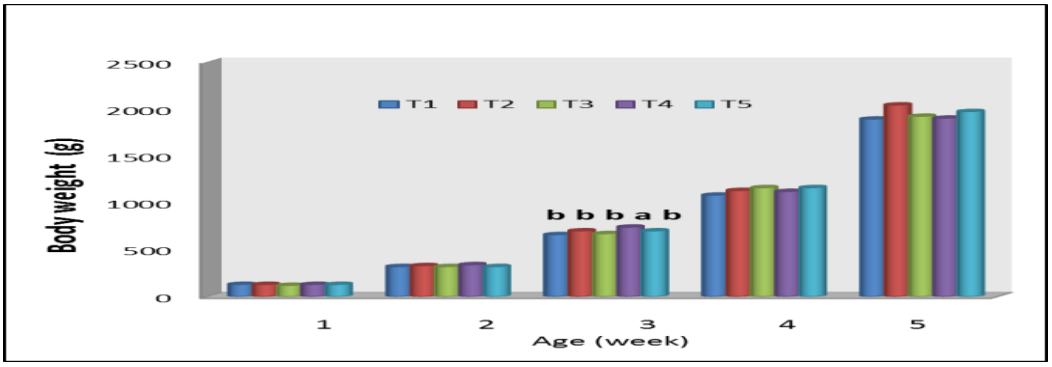

FIGURE 1. Body weight Response of Broiler Fed Partial replacement Rice bran for Yellow Corn, means with similar letters in thesame column are not significantly differencing P<0.05.

Figure 2 shows the statistical analysis of the influence of partial Replacement of Rice Bran for yellow corn on body weight gain, the results indicate that, No significant differences in body weight gain during experimental periods except (2-3) weeks of age when T4 recorded a higher proportion of weight gain by reaching 400 g, whereas no difference between other experimental treatments with control , also during the fourth week (28-35day of age) T2 reached a higher body weight gain compared with all treatments but no difference with control. These feeding diets can be used for chicken meat production with no adverse effect, because no significant differences in feed intake and feed conversion ratio among the five groups throughout the 5 weeks of this study. The feed consumption and feed conversion ratio of each group did not change each week; except group T5 occupied the highest value (P<0.05) in the first week of the study while the other experimental groups did not differ compare with control group (Figure 3 and 4).

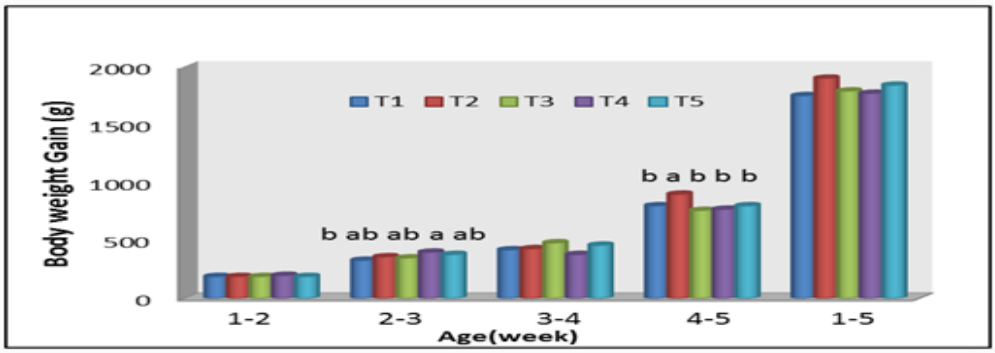

FIGURE 2. Body weight Gain Response of Broiler Fed Partial Replacement of Rice bran for Yellow Corn, means with similar letters in same column are not significantly differencing P<0.05.

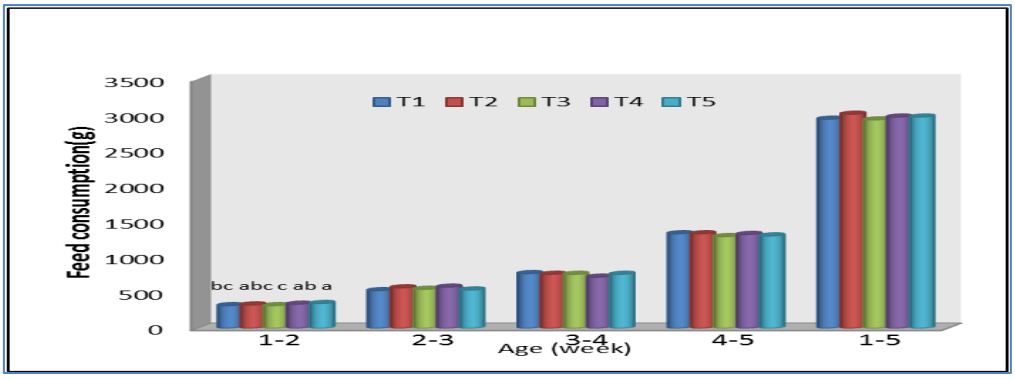

FIGURE 3. Feed consumption(g/bird/week) response of Broiler Fed Partial Replacement of Rice bran for Yellow Corn, means with similar letters in the same column are not significantly differencing P<0.05.

DOI: 10.33794/qjas.2022.133555.1038

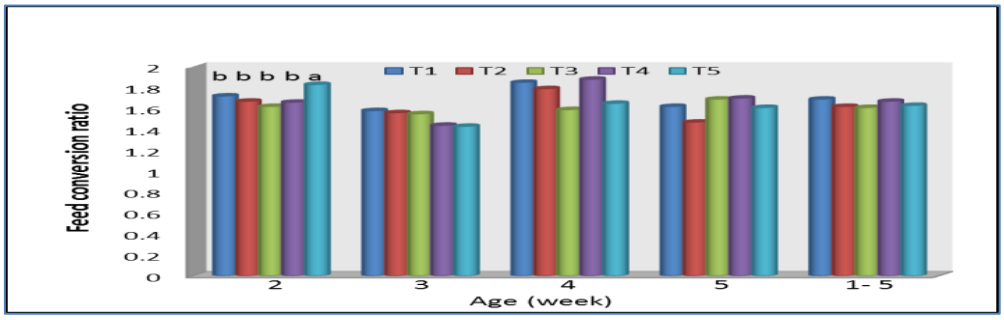

FIGURE 4. Feed conversion ratio response of Broiler Fed Partial Replacement of Rice bran for Yellow Corn, means with similar letters in the same column are not significantly differencing P<0.05.

IV. DISCUSSION

All the experimental birds showed no significant differences for all productive characters especially at marketing age for live body weight and other recorded parameters during the total period (1-5) weeks of age. This performance improvement of investigational fowls shows that Rice bran nutritive influenced with portion of substitution; this may be due to the low concentration of crude fiber and nutrients availability of essential amino acids, vitamins and minerals. A relationship by Fan et.al, (22) showed that, rice bran was improved the health of gut when used in the finisher diet. The rate of growth was not significantly drop in the investigation testing groups (T3 and T5) for the reason that, Rice bran existence a possible low fiber content which cannot inhibit feed consumption reaction of the higher level of rice bran, which can cause reduced of feed intake in high levels of fibers because of bulkiness effect, this agrees with the finding of (11,23) who revealed that high concentration of non-starch polysaccharides NSP in diet cause bad effects on growth performance of broiler, Therefore advancing the nutritional value of rice bran through acetic acid usage also minimized any toxic factors (9).The fiber negative effect was significantly on body weight and feed conversion ratio liked with the rice bran accumulation in broiler diets (18). The overall comparison is broiler performance enhancement of chicken growth through no rationally reduced amount of feed intake as a less fiber content in experimental diets (table 1) as compared with control diet T1, which banded the bad effect of any nutritional factors in rice bran.

CONCLUSION

As of our present study it can conclude that supplementing diet with raw rice bran or conserved by Ascorbic acid has enhanced growth performance in broiler Ross308, marketing live body weight and feed conversion ratio, but there are no effects on mortality for all experimental groups. Hence rice bran in a percentage of 5-7.5 % will be safely used as a replacement in broiler diets.

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DOI: 10.33794/qjas.2022.133555.1038