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EFFECT OF SUPPLEMENTATION OF SOME MEDICAL HERBS OR THEIR EXTRACTS ON THE PERFORMANCE AND PHYSIOLOGICAL FUNCTIONS IN BROILER CHICKENS.

2-EFFECT OF CURCUMIN AND ANISE GROUND SEEDS LEVELS AND THEIR INTERACTIONS ONGROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF BROILER CHICKENS.

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SUMMARY

The present study was designed to investigate the effect of curcumin and anise ground seeds levels as well as their interactions on growth performance and some carcass traits of Ross308 broiler chickens. Two hundred and ninety seven birds were randomly assigned in (3×3) factorial design experiment. Three curcumin levels (0 ,50,100 mg/kg in diet) and three anise ground seeds levels (0 ,0.50% and 1% in diet) were used in nine treatments of 33 birds each (three replicates of 11 birds each).The body weight and feed intake were measured weekly and consequently, weight gain and feed conversion ratio were calculated. At the end of the experiment, three birds from each group were sacrificed to evaluate carcass parts. The results showed that chickens fed curcumin at level of 100 mg/kg diet achieved significantly higher body weight at 14 days of age and body weight gain during the period of 7-14 days than control. The addition of anise ground seeds at level of 1% achieved higher feed intake than control. The addition of 50 mg/kg diet of curcumin and 1% anise ground seeds achieved better feed consumption during the period from 14-21 and 21-28 days of age than other interactions. No significant (P>0.05) effects on feed conversion ratio due to curcumin, anise ground seeds and their interactions were obtained. There were significant (P<0.05) effect due to curcumin levels on hart and left femur. Also, There were significant (P<0.05) effect due to anise seeds on shank , tibia left and neck. No significant (P>0.05) effect due to either curcumin or anise ground seeds or their interactions were observed on carcass and dressed percentages.

It was recommended that curcumin may be added at level of 100 or 50 mg/kg diet, or 50 mg/kg of curcumin plus 1% anise ground seeds to achieve higher growth performance and carcass criteria of broiler chicken (Ross 308).

Keywords : Broilers ,Curcumin, Anise, growth, performance, carcass

INTRODUCTION

Medicinal herbs have begun to be recognized in agricultural production because they contain compounds of great benefit and importance for their physiological effect and therapeutic activity in humans and animal nutrition, Motlaq and Sadik.,2012). The medicinal plants and their extracts are characterized by their ability to treat many diseases without causing serious side effects compared to chemically manufactured medicines that may cause damages in the long run (A.O.A.D ,1988).Among these medicinal plants are turmeric*(Curcuma longa)*and anise seeds *(Pimpinella anisum).*In particular, there is curcumin, the main active component extracted from *Curcuma longa*, a medicinal plant originally from Asia, which has demonstrated economic relevance owing to the properties present in its rhizomes (Khan *et al.*, 2012).

Badran *et al*. (2020) found improvement in body weight of broilers at 3 and 5 weeks of age and in body weight gain during the periods of (1-3),(3-5),(1-5) weeks of age of broilers fed diets containing curcumin (50,100 mg/ kg) compared with the control group, with no reported side effects on dressing%, heart%, proventriculus%, gizzard%, spleen%, carcass yield% when feeding chicks with diets containing curcumin (25,50,100 mg / kg) compared with the control. Cruz *et al*. (2019) reported improvement in body weight in chicks fed diets containing curcumin 0.2% plus aflatoxin B1 2ppm compared to the control diet containing basal feed plus aflatoxin B1 2 ppm at age 14 and21 day. Yesuf *et al*. (2017) found enhanced breast % weight in 49 day old broiler chickens (Cobb500) fed diets containing turmeric (2%) compared to the control. Mondal *et al*. (2015) demonstrated improved % dressing yieldin birds 28-day old broiler chickens fed diets containing turmeric (0.5%,1.5%) compared to the control.

Anise seeds is an aromatic annual herbal plant native to the middle east, and Egypt. The dry fruits of anise seeds contain 2-6% aromatic oils, the most important of which are anethole 80-90%, estragole 2%, anis aldehyde1%, inalol, alpha-terpineol, It

works as a general stimulant, appetite stimulant, anti-fungi, bacteria and virus repellant, gas repellent, and respiratory system disease treatment (ACSAD 2012(.Anise seeds can be used as a growth stimulant in poultry, as it increases the production of gastric juice and its antibacterial effect, as many researchers have noted an improvement in some productive characteristics when adding anise seeds to diets of broiler chicks (Cifftci *et al*.,2005). Improved body weight and body weight gain and feed conversion ratio were observed in 6 weeks broiler chickens fed diets containing anise seeds (0.3% and 0.6%) compared to the control treatment (Amein *et al*., 2019). Mohammed (2019) found that an improved body weight and body weight gain were observed in of broiler chickens fed diets containing anise seeds (0.3%,0.6%,0.9%) compared to the control as well as an improved dressing percentage % was observed compared to the control . Moreover body weight gain broiler chickens fed diets containing anise seeds (0.5,0.75, 1 gm/kg) compared to the control besides, improved carcass %was abs observed in 6 week old Cobb broiler chickens compared to the control (Ramadan 2017).

Therefore, this study was conducted to investigate the effect of curcumin and anise ground seeds levels percentages and their interactions on growth performance and carcass traits of broiler chickens.

MATERIALS AND METHODS

The current study was carried out at special farms in Senbellawein Dakahlia Egypt between September 2020 and October 2020. A total number of 297 (two hundred ninety seven) unsexed Ross 308 broiler chicks at one day-old, were used. Consequently, chicks were equally distributed into 9 treatments with an average body weight (45.02 ±1.07g) and total number (33 chicks/ treatment), each treatment further divided into 3 replicates (11 chicks each). All diets were formulated to meet or exceed (NRC, 1994) recommendations for essential amino acids in starter diet from day one to twenty-one days of age (Table 1) and grower diet from twenty-two days to forty-two days of age (Table 2). Chicks were housed in floor pens (1×1 m) and brooded throughout the experimental period on a Sawdust litter (5-7 cm). The chicks were reared under 34°C temperature as standard brooding temperature and 60% relative humidity during the first week, then gradually reduced 2°C every week to reach 24°C and 55% relative humidity. A factorial design experiment (3×3) was used. Three levels of curcumin (control, 50 and 100 mg/kg) and three percentages of ground anise seeds (control, 0.5 and 1% / kg diet) were used.

Feed analysis:

The feed raw materials were purchased from a local sources. Dry matter% ,crude protein%, crude fiber%, ash%, ether extract % were estimated in the feed by Dakahlia Poultry company - Damas - Egypt using the device of NIRSTMDS2500FA. Calcium and total phosphorous in the feed was chemically estimated well following the standard methods of analysis described by the Association of Official Analytical Chemists (AOAC,1990) in the Animal Production Laboratory, Faculty of Agriculture, Al-Azhar University, Assiut– Egypt.

Studied traits:

Body weight , body weight gain ,feed consumption, feed conversion ratio and carcass traits:

Body weights (BW) were recorded at one-day old and at one ,two ,three ,four ,five and six weeks of age. Fed consumption (FC) were also recorded/ weekly and calculated as gram feed/bird/week for the same periods. Body weight gain (BWG) were calculated at (0-7 days), (7-14 days), (14-21 days), (21-28 days),(28-35 days),(35-42 days of age),(0-3),(3-6) and (0-6)weeks of age . Feed conversion ratio (FCR) were also calculated at (0-3), (3-6) and (0-6) weeks of age. Feed conversion ratio = Feed intake (Kg)/ Body weight gain (Kg). At the end of the experiment (6weeks of age), 27 birds were randomly taken as representative samples , 3 birds per treatment ; one bird per replicate ,the birds were individually weighed , slaughtered by cutting the neck near the first cervical vertebra and then blooded freely 10 minutes, to evaluate carcass ratio of the dressed carcass (carcass weight + giblets weight), edible viscera weight (Giblets = liver, heart and gizzard), breast meat yield, Tibia and femur as percentages of the live weight were also recorded.

Statistical analysis:

Data obtained from this study were analysed by factorial design (3*3)using the SAS procedure (Version 2006). Duncan's multiple range test (1955) was also used to determine differences among means.

The statistical model used as following:

$Y_{ijk}= \mu+ Cur_i+ Anis_j+ (Cur * Anis)_{ij}+ e_{ijk}$

Where;

Y_{ijk} = An observation of traits.

μ= The overall mean.

Curi= The fixed effect of

th curcumin (where i = 1, 2 and 3).

Anisj= The fixed effect of;

th anised (where j = 1, 2 and 3).

$(Cur *Anis)_{ij}$= Interaction of Curcumin levels×Anis seeds. percentages

e_{ijk}=The Experimental random error.

Table 1. Composition, chemical and calculated analysis of the starter experimental diet

Items	Treatments								
	T1	T2	T3	T4	T5	T6	T7	T8	T9
Composition%									
Anise seeds%	0	0.5	1	0	0.5	1	0	0.5	1
Curcumin(Mg/Kg)	0	0	0	50	50	50	100	100	100
Yellow corn%	54.30	54.20	54.20	54.30	54.20	54.20	54.30	54.20	54.20
Soy bean meal (46)%	36.99	36.79	36.79	36.99	36.79	36.79	36.99	36.79	36.79
Sunflower oil%	4.90	4.70	4.50	4.90	4.70	4.50	4.90	4.70	4.50
Di–Ca Po4%	1.73	1.73	1.53	1.73	1.73	1.53	1.73	1.73	1.53
Lime stone%	1.33	1.33	1.23	1.33	1.33	1.23	1.33	1.33	1.23
DL -Methionine%	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Premix %*	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Common salt%	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Total%	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Chemical analysis (%)									
Dry matter%	88.84	88.64	88.40	88.62	88.50	88.56	88.37	88.61	88.64
Crude protein%	22.66	22.72	22.47	22.18	22.23	22.40	22.54	22.43	22.23
Ether extract%	7.24	7.59	7.38	7.22	6.77	7.27	7.34	6.91	7.77
%fiber Crude	2.61	2.46	2.25	3.19	2.44	2.25	2.57	3.12	2.42
NFE%	50.35	49.79	50.28	50.00	51.08	50.63	49.81	50.33	50.29
Ash%	5.98	6.08	6.02	6.03	5.98	6.01	6.11	5.82	5.93
Calcium%	1.06	1.22	1.06	1.30	1.22	1.30	0.89	1.14	1.14
Total phosphorus%	0.60	0.59	0.53	0.60	0.72	0.60	0.51	0.66	0.57
ME, Kcal/kg DM	3187	3198	3189	3155	3159	3190	3172	3151	3212
Calculated (%)									
Crude protein%	21.50	21.40	21.40	21.50	21.40	21.40	21.50	21.40	21.40
Ether extract%	4.03	4.02	4.02	4.03	4.02	4.02	4.03	4.02	4.02
Crude fiber%	3.84	3.82	3.82	3.84	3.82	3.82	3.84	3.82	3.82
Ash%	3.11	3.10	3.10	3.11	3.10	3.10	3.11	3.10	3.10
Calcium%	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91
Total phosphorus%	0.72	0.71	0.68	0.72	0.71	0.68	0.72	0.71	0.68
Av phosphorus%	0.42	0.42	0.39	0.42	0.42	0.39	0.42	0.42	0.39
Lysine%	1.24	1.23	1.23	1.24	1.23	1.23	1.24	1.23	1.23
Methionine%	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53
ME, Kcal/kg DM	3158	3133	3116	3158	3133	3116	3158	3133	3116

*Each 3 kg of vitamin mineral premix: contains: vitamin A, 1200000IU; vitamin D3, 300000IU; vitamin E,700 mg; vitamin K3, 500 mg; vitamin B1 500 mg; vitamin B2 200 mg; vitamin B6, 600 mg, vitamin B12, 3 mg; folic acid, 300 mg; choline chloride, 1000 mg; Niacin, 3000 mg; Methionine 3000 mg; Biotin 6 mg; panathonic acid 670 mg; manganese sulphate, 3000 mg; iron sulphate, 10000 mg, zinc sulphate, 1800 mg, copper sulphate 3000 mg, iodine 1.868 mg, cobalt sulphate, 300 mg; selenium, 0.108 mg .

Table 2. Composition, chemical and calculated analysis of the grower finisher diets

Items	Treatments								
	T1	T2	T3	T4	T5	T6	T7	T8	T9
composition%									
Anise seeds%	0	0.5	1	0	0.5	1	0	0.5	1
Curcumin(Mg/Kg)	0	0	0	50	50	50	100	100	100
Yellow corn%	61.50	61.40	61.40	61.50	61.40	61.40	61.50	61.40	61.40
Soy bean meal (46)%	29.75	29.55	29.55	29.75	29.55	29.55	29.75	29.55	29.55
Sunflower oil%	4.90	4.70	4.50	4.9	4.7	4.5	4.9	4.7	4.5
Di–Ca Po4%	1.72	1.72	1.52	1.72	1.72	1.52	1.72	1.72	1.52
Lime stone%	1.33	1.33	1.23	1.33	1.33	1.23	1.33	1.33	1.23

Table 2. Cont.

Items	Treatments								
	T1	T2	T3	T4	T5	T6	T7	T8	T9
composition%									
DL -Methionine%	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Premix %*	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Common salt%	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Total%	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Chemical analysis (%)									
Dry matter%	88.54	88.44	88.10	88.41	88.79	88.84	88.53	88.33	88.31
Crude protein%	19.61	19.07	18.89	19.36	18.74	18.83	18.47	18.74	19.20
Ether extract%	7.53	7.76	7.19	6.96	7.62	7.79	7.02	7.98	7.52
%fiber Crude	2.53	2.08	2.92	2.49	2.03	2.46	2.24	2.05	2.02
NFE%	52.76	53.65	53.01	53.52	54.6	54.05	54.86	53.25	53.5
Ash%	6.11	5.88	6.09	6.08	5.80	5.71	5.94	6.31	6.07
Calcium%	1.38	1.22	1.14	1.22	1.06	1.22	1.30	0.89	1.06
Total phosphorus%	0.60	0.56	0.55	0.58	0.54	0.58	0.66	0.58	0.62
ME, Kcal/kg DM	3182	3212	3137	3153	3222	3219	3172	3204	3192
Calculated (%)									
Crude protein%	18.78	18.68	18.68	18.78	18.68	18.68	18.78	18.68	18.68
Ether extract%	4.38	4.37	4.37	4.38	4.37	4.37	4.38	4.37	4.37
Crude fiber%	3.46	3.45	3.45	3.46	3.45	3.45	3.46	3.45	3.45
Ash%	2.73	2.72	2.72	2.73	2.72	2.72	2.73	2.72	2.72
Calcium%	0.97	0.97	0.89	0.97	0.97	0.89	0.97	0.97	0.89
Total phosphorus%	0.69	0.69	0.65	0.69	0.69	0.65	0.69	0.69	0.65
Av phosphorus%	0.40	0.40	0.36	0.40	0.40	0.36	0.40	0.40	0.36
Lysine%	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Methionine%	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
ME, Kcal/kg DM	3252	3227	3211	3252	3227	3211	3252	3227	3211

*Each 3 kg of vitamin mineral premix: contains: vitamin A, 1200000IU; vitamin D3, 300000IU; vitamin E,700 mg; vitamin K3, 500 mg; vitamin B1 500 mg; vitamin B2 200 mg; vitamin B6, 600 mg, vitamin B12, 3 mg; folic acid, 300 mg; choline chloride, 1000 mg; Niacin, 3000 mg; Methionine 3000 mg; Biotin 6 mg; panathonic acid 670 mg; manganese sulphate, 3000 mg; iron sulphate, 10000 mg, zinc sulphate, 1800 mg, copper sulphate 3000 mg, iodine 1.868 mg, cobalt sulphate, 300 mg; selenium, 0.108 mg

RESULTS AND DISCUSSION

Effects of curcumin levels , anise ground seeds,% and their interactions on:

Body weight (BW):

The effects of curcumin levels , anise ground seeds percentages and their interactions on body weight of Ross308 broiler chickens are presented in Table3.

The results showed that no significant *(P<0.05)* effects in body weight were observed at first, third, fourth, fifth and sixth weeks of age. Our results are in agreement with Gabriela *et al*. (2020) who found that no significant differences in body weight were observed at 3 and 6 weeks of age of broiler chickens (Ross 308) fed diets containing curcumin (100 mg / kg) compared to the control. Also, Badran *et al.*, (2020) reported that that there were no statistically significant differences in body weight of Ross308 at 3 and 5 weeks of age fed diets containing curcumin (25 mg / kg) compared to the control group. Xie *et al*. (2019) showed that there was no significant effect on body weight when feeding chicks with diets fed diets containing curcumin (500 mg / kg) compared to the control at age of 49 day. Reversely, Badran *et al*. (2020) found that an improvement in body weight was observed Ross 308 in broilers at 21 and 35 day of age fed on diets containing curcumin (50,100 mg / kg) compared with the control group. Also with Xie *et al*. (2019) reported that body weight decreased in birds at 49 days of age of broiler chickens (Ross 308) fed diets containing curcumin (1000,2000 mg / kg) compared to the control.

However, at two weeks of age the body weight of broiler chicks fed curcumin at level of 100 mg / kg was higher than those fed 50 mg / kg and control.

Regarding to the effect of anise seeds and interactions between levels of anise seed and curcumin, there were no significant (P<0.05) differences in body weight at all ages.

The obtained results are in the same line with (Barakat *et al.*, 2016) who reported that there were no significant in body weight in birds at 5 week of age of broiler chickens (Cobb) fed diets containing anise seeds (0.5,0.75gm/kg) compared to the control . Also, Yazdi *et al*.,(2014) found that there were no significant differences in body weight in birds at

14,28 and 42 days of age of broiler chickens (Ross308) fed diets containing anise ground seeds (1,5,10 gm/kg) compared to the control. In the contrast of Amein *et al.*, (2019) found that an improvement in body weight was observed in birds at 6 week of age of broiler chickens (Ross 308) fed diets containing anise seeds (0.3% and 0.6%) compared to the control.

Table 3. Effect of curcumin levels, anise ground seeds% and their interactions on the body weight (g / bird) of broiler chickens

Weeks Treatments	Age (wks.)						
	One day old	First week	Second week	Third week	Fourth week	Fifth week	Sixth week
Curcumin (mg /Kg diet):							
0	44.98±0.09	147.60±1.67	372.27^{b}±5.63	772.63±19.03	1279.32±25.01	1889.58±33.99	2446.67±43.48
50	44.88±0.11	148.36±2.38	381.01^{ab}±6.92	796.21±16.64	1286.00±35.03	1894.14±51.57	2442.49±63.57
100	45.19±0.11	148.92±1.83	390.14^{a}±4.54	815.05±7.57	1346.40±16.26	1958.33±29.25	2483.84±38.50
Anise seeds (%):							
0	44.97±0.12	149.51±1.98	377.12±8.17	775.61±24.11	1298.59±41.49	1902.60±59.61	2440.89±70.28
0.5	45.01±0.09	146.92±2.07	378.59±4.53	797.07±9.75	1293.20±20.09	1897.35±26.48	2467.88±35.72
1	45.07±0.13	148.45±1.83	387.73±4.97	811.21±7.25	1319.94±16.85	1942.10±25.21	2464.23±35.70
Interactions:							
T1 (0 Cu×0An)	45.12±0.12	148.42±2.95	362.43±10.19	734.39±50.51	1244.49±71.38	1812.40±51.68	2413.60±92.82
T2 (0 Cu× 0.5% An)	44.97±0.11	148.40±2.37	378.49±10.62	781.52±22.13	1296.30±35.93	1885.45±62.24	2461.21±104.77
T3 (0 Cu× 1%An)	44.85±0.15	145.97±4.17	375.91±9.45	801.97±10.15	1297.18±14.56	1970.85±32.14	2465.15±47.63
T4 (50 Cu×0An)	44.73±0.11	151.76±2.29	376.52±18.88	776.67±49.20	1290.61±103.15	1924.51±165.94	2434.79±203.88
T5 (50 Cu× 0.5%An)	45.03±0.23	143.76±5.26	373.94±10.26	791.52±16.18	1242.85±29.44	1845.94±2.13	2430.30±37.51
T6 (50 Cu× 1%An)	44.88±0.22	149.58±4.24	392.57±3.24	820.45±11.91	1324.54±39.20	1911.97±50.94	2462.39±72.26
T7 (100 Cu× 0An)	45.06±0.26	148.36±5.41	392.43±10.70	815.76±18.60	1360.67±38.69	1970.85±76.14	2474.24±90.24
T8 (100Cu× 0.5%An)	45.03±0.16	148.61±3.23	383.33±2.44	818.18±5.46	1340.45±17.24	1960.67±33.79	2512.12±34.95
T9 (100 Cu× 1%An)	45.48±0.03	149.79±0.20	394.70±9.51	811.21±17.33	1338.09±35.01	1943.49±55.97	2465.15±88.31

***T1** control (zero of curcumin or anise seeds),T2 (zero of curcumin and 0.5%anise seeds),T3 (zero of curcumin and 1% anise seeds),T4(50 mg /kg curcumin and zero anise seeds),T5(50 mg /kg curcumin and 0.5%anise seeds),T6 (50 mg /kg curcumin and 1%anise seeds),T7 (100mg /kg curcumin and zero anise seeds),T8 (100mg /kg curcumin and 0.5% anise seeds),T9 (100mg /kg curcumin and 1% anise seeds).
a –b Means in the same columns with different superscript are significantly different (P<0.05).

2-Body weight gain (BWG):

The effects of curcumin levels , anise ground seeds percentages and their interactions on body weight gain of Ross308 broiler chicks are presented in Table 4 and 5.

The results showed that no significant (P<0.05) effects in body weight gain at all ages except 7-14 days of age, in which the body weight gain of broiler chicks fed curcumin at level of 100 mg / kg was higher by about 7.4% than those fed control diet. Our results are in agreement with Gabriela *et al*., (2020) whore ported that there were no significant differences in the period of (1-21) and (1-42) days of age in broiler chickens (Ross 308) fed diets containing curcumin (100 mg / kg) compared to the control. Also, Amein *et al*. (2019) indicated that ther was no significant effect on body weight gain when feeding chicks(Ross 308) diets containing curcuma (0.3%, 0.5%) compared to the control diet at age of 1 ,2 and 3 week. In contrast, Badran *et al*., (2020) found that an improvement significantly in body weight gain was observed in broilers at (1-3), (3-5),(1-5) weeks of age (Ross 308) of chickens fed diets containing curcumin (50,100 mg / kg) compared with the control group. Also ,Gabriela *et al*., (2020) reported that body weight gain decreased in (1-35) day of age of broiler chickens (Ross 308) fed diets containing curcumin (100 mg/kg) compared to the control. Rajput *et al*. (2012) reported significantly improved (P<0.05) in body weight gain in birds at (22-42),(0-42) days of age of broiler chickens (Arbor Acre) fed diets containing curcumin (100,150,200 mg / kg) compared to the control.

However, a numerically improved in body weight gain of birds fed on diets containing curcumin)100 mg/kg) when compared with the control and the second level (50 mg/kg) of curcumin.

Regarding to the effect of anise seeds and interactions between levels of anise seed and curcumin, the results showed that there were no significant differences in body weight gain at all ages. Our results are in the same line with Barakat *et al*. (2016) who reported that no significant effect on body weight gain was observed in birds at (1-5) week old broiler chickens (Cobb) fed diets containing anise seeds (0.5,0.75 gm/kg) compared to the control. Also, Mahmod (2013) reported that there was no significant effect on body weight gain when feeding chicks diets containing anise seeds (0.2%,0.4%,0.6%) compared to control diet at age (7-35)day. In the contrast of Amein *et al.* (2019) reported that improved body weight gain was observed in

birds at (0-6) week of age of broiler chickens (Ross 308) fed diets containing anise seeds compared to the control diet .

Table 4. Effect of curcumin levels, anise ground seeds% and their interactions on the body weight gain (g/bird) of broiler chickens

Days Treatments	Age (days)					
	At 7 days	7-14 days	14-21 days	21-28 days	28-35 days	35-42 days
Curcumin (mg /Kg):						
0	102.62±1.66	224.68[b]±5.91	400.35±15.87	506.70±14.75	610.25±26.53	557.09±28.24
50	103.48±2.42	232.65[ab]±5.98	415.20±10.34	489.79±21.22	608.14±24.57	548.35±20.49
100	103.73±1.91	241.23[a]±3.99	424.90±5.38	531.35±11.55	611.93±13.82	525.50±18.64
Anise seeds (%):						
0	104.55±2.04	227.61±7.91	398.48±16.57	522.98±19.35	604.01±25.45	538.29±28.96
0.5	101.91±2.08	231.67±3.98	418.48±9.00	496.13±17.91	604.15±17.82	570.53±19.77
1	103.37±1.85	239.28±4.07	423.48±5.23	508.73±13.03	622.16±22.52	522.13±15.83
Interactions:						
T1 (0 Cu×0An)	103.30±2.90	214.00±12.97	371.97±40.44	510.09±20.88	567.94±31.89	601.21±66.23
T2 (0 Cu×0.5%An)	103.43±2.27	230.09±11.00	403.03±24.76	514.79±38.47	589.15±50.03	575.76±42.61
T3 (0 Cu×1%An)	101.12±4.22	229.94±6.62	426.06±6.02	395.21±24.31	673.67±42.38	494.30±15.78
T4 (50 Cu×0An)	107.03±2.24	224.76±16.68	400.15±30.36	513.94±54.58	633.91±64.30	510.27±43.44
T5 (50 Cu×0.5%An)	98.73±5.27	230.18±7.82	417.58±9.00	451.33±20.60	603.09±28.13	584.36±35.39
T6 (50 Cu×1%An)	104.70±4.40	243.00±1.43	427.88±9.24	504.09±29.44	587.43±41.95	550.43±22.92
T7 (100 Cu×0An)	103.31±5.66	244.06±8.48	423.33±8.43	544.91±26.73	610.18±38.78	503.39±28.46
T8 (100Cu×0.5%An)	103.58±3.37	234.73±0.80	434.85±4.47	522.27±20.70	620.21±16.59	551.46±36.46
T9 (100 Cu×1%An)	104.30±0.21	244.91±9.31	416.52±13.03	526.88±17.71	605.39±21.38	521.66±38.00

*T1 control(zero of curcumin or anise seeds),T2 (zero of curcumin and 0.5%anise seeds),T3 (zero of curcumin and 1% anise seeds),T4(50 mg /kg curcumin and zero anise seeds),T5(50 mg /kg curcumin and 0.5%anise seeds),T6 (50 mg /kg curcumin and 1%anise seeds),T7 (100mg /kg curcumin and zero anise seeds),T8 (100mg /kg curcumin and 0.5% anise seeds),T9 (100mg /kg curcumin and 1% anise seeds).

Table 5. Effect of curcumin levels, anise ground seeds% and their interactions on the body weight gain (g /bird) of broiler chickens

Weeks Treatments	Age (wks.)		
	0-3	3-6	0-6
Curcumin (mg /Kg):			
0	727.65±19.03	1674.04±39.52	2401.68±43.49
50	751.33±16.61	1646.28±51.01	2397.62±63.57
100	769.86±7.63	1668.79±33.81	2438.65±38.48
Anise seeds (%):			
0	730.64±24.10	1665.28±53.00	2395.92±70.23
0.5	752.06±9.72	1670.81±38.95	2422.87±35.72
1	766.14±7.29	1653.02±31.86	2419.16±35.75
Interactions:			
T1 (0 Cu×0An)	689.27±50.45	1679.24±48.42	2368.52±92.70
T2 (0 Cu×0.5%An)	736.54±22.03	1679.70±121.28	2416.24±104.87
T3 (0 Cu×1%An)	757.12±10.30	1663.18±40.03	2420.30±47.74
T4 (50 Cu×0An)	731.94±49.12	1658.12±155.18	2390.06±203.79
T5 (50 Cu×0.5%An)	746.48±16.11	1638.79±40.47	2385.27±37.29
T6 (50 Cu×1%An)	775.58±12.03	1641.94±73.47	2417.52±72.44
T7 (100 Cu×0An)	770.70±18.76	1658.48±84.44	2429.18±90.12
T8 (100Cu×0.5%An)	773.15±5.49	1693.94±32.19	2467.09±34.83
T9 (100 Cu×1%An)	765.73±17.36	1653.94±71.20	2419.67±88.34

*T1 control(zero of curcumin or anise seeds),T2 (zero of curcumin and 0.5%anise seeds),T3 (zero of curcumin and 1% anise seeds),T4(50 mg /kg curcumin and zero anise seeds),T5(50 mg /kg curcumin and 0.5%anise seeds),T6 (50 mg /kg curcumin and 1%anise seeds),T7 (100mg /kg curcumin and zero anise seeds),T8 (100mg /kg curcumin and 0.5% anise seeds),T9 (100mg /kg curcumin and 1% anise seeds).

Feed consumption (FI).

The effects of curcumin levels, anise ground seeds percentages and their interactions on fed consumption of Ross308 broiler chicks are presented in Table 6 and 7.The results showed that there were no significant (P<0.05) differences in feed consumption at all ages due to curcumin. Our results are in agreement with Badran *et al*. (2020) who found that no significant differences in feed intake at (1-3) weeks of age (Ross 308) in chickens fed diets containing curcumin (25 mg / kg) compared with the control group. Also, Xie *et al*. (2019) found that there was no significant effect on feed intake when feeding chicks with diets containing curcumin (500,1000,2000 mg / kg) compared to the control diet at age of (22-49) days. In contrast Salah, *et al,*.(2019) found that an improved fed consumption was observed in birds(3-6)week of age of broiler chickens (Ross) exposed to heat stress and fed diets containing curcumin (100mg / kg) compared to the control . Also, Gabriela *et al.* (2020) observed a decrease in feed intake was observed in birds at (1-42) days of age of broiler chickens (Ross) fed diets containing curcumin (100 mg / kg) compared to the control.

Regarding to the effect of anise seeds, there were no significant differences in feed consumption at all ages except at fourth weeks of age, in which the feed consumption of broiler chicks fed anise seeds at level of (1%) was higher than those fed (0.5%) and control. Our results are in agreement with Amein *et al*., (2019) who found that no significant effect on feed intake was observed in birds at 1,2,3,5 and (0-6)week of age of broiler chickens (Ross 308) fed diets containing anise seeds (0.3%,0.6%) compared to the control. Also, Yazdi *et al*., (2014) reported that there was no significant(P<0.05) effect in feed consumption was observed in birds at (0-14),(28-42) and (0-42) days of age of broiler chickens (Ross 308) fed diets containing anise seeds (1,5,10gm/kg) compared to the control. Reversely, Eltazi (2014) found that an improve in feed intake was observed in birds at (0-6) week of age of broiler chickens (Ross 308) fed diets containing anise seeds (0.5%,0.75%,1%) compared to the control. Also, Al-Kassie (2008) observed a decrease in feed intake in birds at 3 ,5 weeks of age of broiler chickens (Arbor acre) fed diets containing anise seeds (0.5%,1%) compared to the control .

Regarding to the effect of interactions, there were significant (P<0.05) differences due to interactions during the periods of 14-21, 21-28 and (0-21) days of age .The sixth group(50 mg/kg curcumin ×1% anise seeds) had the highest feed consumption in periods of 14-21 and 21-28 days of age, while the seventh treatment (100 mg/kg curcumin) had the highest feed consumption at the period of 0-3 weeks of age.

Table 6. Effect of curcumin levels, anise ground seeds% and their interactions on the feed consumption (g) of broiler chickens

Days Treatments	Age (days)					
	At 7 days of age	7-14 days	14-21 days	21-28 days	28-35 days	35-42 days
Curcumin (mg /Kg):						
0	121.60±2.15	317.07±4.41	556.66±9.15	770.43±16.89	987.16±31.19	1120.89±30.14
50	122.08±1.48	320.56±5.97	566.38±6.38	783.39±23.25	1014.37±18.68	1129.09±22.59
100	120.89±2.43	328.85±3.76	573.41±4.83	768.41±17.46	1026.45±18.96	1125.03±19.84
Anise seeds(%):						
0	122.87±2.44	319.32±6.13	556.01±9.39	751.93b±18.41	997.66±29.25	1118.79±27.53
0.5	119.99±1.46	317.77±3.76	564.56±5.70	756.34b±17.45	1009.25±21.56	1146.88±26.34
1	121.71±2.05	329.38±4.08	575.88±4.45	813.97a±14.29	1021.08±20.68	1109.34±16.41
Interactions:						
T1 (0 Cu×0An)	121.57±3.77	311.36±9.01	533.30^{b}±15.01	766.70^{ab}±32.64	929.00±53.00	1149.39±55.10
T2 (0 Cu×0.5%An)	123.24±2.43	318.06±5.76	556.73^{ab}±13.95	760.64^{ab}±45.59	988.46±68.80	1130.09±80.78
T3 (0 Cu×1%An)	119.97±5.71	321.79±9.54	579.94^{a}±6.36	783.97^{ab}±11.54	1044.03±28.68	1083.18±13.45
T4 (50 Cu×0An)	123.60±3.74	313.76±13.98	555.21^{ab}±17.17	772.76^{ab}±33.30	1050.61±36.25	1099.24±55.24
T5 (50 Cu×0.5%An)	120.18±2.61	315.85±11.45	570.12^{a}±9.78	723.61^{b}±21.01	1012.03±15.46	1157.48±38.11
T6 (50 Cu×1%An)	122.45±1.59	332.06±0.97	573.82^{a}±0.63	853.82^{a}±24.75	980.49±37.44	1130.55±27.76
T7 (100 Cu×0An)	123.42±6.46	332.85±5.99	579.52^{a}±2.05	716.33^{b}±30.54	1013.36±47.57	1107.73±47.85
T8 (100Cu×0.5%An)	116.55±1.32	319.39±1.54	566.85^{ab}±7.16	784.79^{ab}±13.58	1027.27±14.92	1153.06±11.57
T9 (100 Cu×1%An)	122.69±3.62	334.30±7.97	573.88^{a}±13.56	804.12^{ab}±20.34	1038.73±40.81	1114.30±41.25

*T1 control(zero of curcumin or anise seeds),T2 (zero of curcumin and 0.5%anise seeds),T3 (zero of curcumin and 1% anise seeds),T4(50 mg /kg curcumin and zero anise seeds),T5(50 mg /kg curcumin and 0.5%anise seeds),T6 (50 mg /kg curcumin and 1%anise seeds),T7 (100mg /kg curcumin and zero anise seeds),T8 (100mg /kg curcumin and 0.5% anise seeds),T9 (100mg /kg curcumin and 1% anise seeds).
a –b Means in the same columns with different superscript are significant different (P<0.05).

Table 7. Effect of curcumin levels and anise ground seeds% and their interactions on the fed consumption (g) of broiler chickens

Weeks Treatments	Age (wks.)		
	0-3	3-6	0-6
Curcumin (mg /Kg):			
0	995.32±11.91	2878.48±62.75	3873.81±67.83
50	1009.02±12.37	2926.86±46.23	3935.88±55.69
100	1023.15±9.56	2919.90±46.98	3943.05±49.68
Anise seeds (%):			
0	998.20±15.17	2868.37±55.78	3866.58±64.39
0.5	1002.32±7.95	2912.47±58.03	3914.80±61.19
1	1026.97±8.99	2944.39±40.12	3971.36±44.21
Interactions:			
T1 (0 Cu×0An)	966.24^{b}±20.38	2845.09±87.35	3811.34±105.02
T2 (0 Cu×0.5%An)	998.03^{ab}±11.23	2879.18±189.55	3877.21±196.23
T3 (0 Cu×1%An)	1021.70^{ab}±19.62	2911.18±50.93	3932.88±44.46
T4 (50 Cu×0An)	992.58^{ab}±31.15	2922.61±124.12	3915.18±155.21
T5 (50 Cu×0.5%An)	1006.15^{ab}±23.22	2893.12±45.69	3899.27±62.54
T6 (50 Cu×1%An)	1028.33^{ab}±1.03	2964.85±82.79	3993.18±81.79
T7 (100 Cu×0An)	1035.79^{a}±11.92	2837.42±109.91	3873.21±109.10
T8 (100Cu×0.5%An)	1002.79^{ab}±8.69	2965.12±16.36	3967.91±16.61
T9 (100 Cu×1%An)	1030.88^{a}±23.70	2957.15±94.99	3988.03±116.95

*T1 control(zero of curcumin or anise seeds),T2 (zero of curcumin and 0.5%anise seeds),T3 (zero of curcumin and 1% anise seeds),T4(50 mg /kg curcumin and zero anise seeds),T5(50 mg /kg curcumin and 0.5%anise seeds),T6 (50 mg /kg curcumin and 1%anise seeds),T7 (100mg /kg curcumin and zero anise seeds),T8 (100mg /kg curcumin and 0.5% anise seeds),T9 (100mg /kg curcumin and 1% anise seeds).
a –b Means in the same columns with different superscript are significant different (P<0.05).

4-Feed Conversion Ratio (FCR).

The effects of curcumin levels , anise ground seeds percentages and their interactions on feed conversion ratio of Ross308 broiler chicks during the periods of (0-3),(3-6)and (0-6wks of age) are presented in Table 8.

Table 8. Effect of curcumin levels, anise ground seeds% and their interactions on the fed conversion ratio of broiler chickens

Weeks Treatments	Age(wks.)		
	0-3	3-6	0-6
Curcumin (mg /Kg):			
0	1.373±0.027	1.721±0.021	1.614±0.014
50	1.346±0.018	1.786±0.033	1.647±0.025
100	1.330±0.014	1.752±0.023	1.618±0.017
Anise seeds (%):			
0	1.373±0.030	1.731±0.038	1.614±0.029
0.5	1.334±0.015	1.745±0.016	1.616±0.010
1	1.341±0.012	1.783±0.020	1.643±0.014
Interactions:			
T1 (0 Cu×0An)	1.413±0.077	1.696±0.061	1.612±0.044
T2 (0 Cu×0.5%An)	1.357±0.041	1.716±0.017	1.604±0.012
T3 (0 Cu×1%An)	1.349±0.017	1.751±0.024	1.626±0.016
T4 (50 Cu×0An)	1.363±0.054	1.782±0.101	1.652±0.084
T5 (50 Cu×0.5%An)	1.348±0.005	1.767±0.034	1.635±0.020
T6 (50 Cu×1%An)	1.327±0.021	1.809±0.030	1.653±0.017
T7 (100 Cu×0An)	1.345±0.024	1.714±0.039	1.596±0.022
T8 (100Cu×0.5%An)	1.297±0.005	1.752±0.030	1.609±0.018
T9 (100 Cu×1%An)	1.347±0.028	1.791±0.050	1.650±0.041

*T1 control(zero of curcumin or anise seeds),T2 (zero of curcumin and 0.5%anise seeds),T3 (zero of curcumin and 1% anise seeds),T4(50 mg /kg curcumin and zero anise seeds),T5(50 mg /kg curcumin and 0.5%anise seeds),T6 (50 mg /kg curcumin and 1%anise seeds),T7 (100mg /kg curcumin and zero anise seeds),T8 (100mg /kg curcumin and 0.5% anise seeds),T9 (100mg /kg curcumin and 1% anise seeds).

The results showed that there were no significant (P<0.05) effect of either curcumin or anise ground seeds alone as well as their interactions on the feed conversion ratio. Our results are in agreement with Badran *et al.,* (2020) who found that no significant differences on feed conversion ratio of broiler chicken (Ross 308) at (3-5),(1-5) weeks of age were observed due to curcumin supplementation (25 mg / kg) compared with the control group. Gabriela *et al.,* (2020) indicated that no significant effect was found on feed conversion ratio when feeding chicks with diets fed diets containing curcumin (100 mg / kg) compared to the control.

Concerning anise ground seeds, our results are in agreement with Mahmod (2013) who found that no significant (P<0.05) effect on feed conversion ratio when feeding chicks diets containing anise seeds (0.2%,4%,0.6%) compared to control at 7-35 days of age . Soltan *et al.* (2008) reported that no significant effect was observed on conversion ratio when feeding chicks with diets containing anise seeds (0.25,0.5,1,1.25,1.5 gm/kg) compared to control group. Amein *et al*. (2019) found that an improve in feed conversion ratio was observed in (0-6) week of age of broiler chickens (Ross 308) fed diets containing anise seeds (0.3%,0.6%) compared to the control.

Carcass Criteria.

The effect of curcumin levels, anise ground seeds percentages and their interactions on blood%, feather%, carcass%, dressing%, liver%, heart%, glandular stomach%, gizzard% , shank%, tibia%, femur% and head%, neck%, wings%, breast% and alimentary canal% are presented in Table 9.

Table 9. Effect of curcumin levels, anise ground seeds% and their interactions on the carcass edible parts (%) of broiler chicks at 42 day of age

Items	body weight (g.)	Blood%	Feather%	Carcass%	Dressing%	Liver%	%Hart
Curcumin (mg /Kg):							
0	2442±52.06	3.41±0.37	4.59±0.27	71.93±1.08	75.97±0.92	1.90±0.13	0.349^{a}±0.015
50	2370±75.47	3.14±0.14	3.70±0.24	73.96±1.22	78.30±1.11	2.25±0.15	0.300^{b}±0.014
100	2495±79.65	2.70±0.20	3.76±0.36	73.59±0.68	77.77±0.57	2.25±0.19	0.309^{ab}±0.013
Anise seeds (%):							
0	2454±60.02	3.47±0.33	4.04±0.30	73.93±1.09	78.00±1.09	2.05±0.10	0.318±0.022
0.5	2467±83.46	3.05±0.13	3.98±0.38	72.75±1.16	77.02±1.04	2.26±0.16	0.301±0.014
1	2386±70.72	2.73±0.26	4.02±0.35	72.79±0.93	77.02±0.79	2.10±0.23	0.338±0.007
Interactions:							
T1 (0 Cu×0An)	2530±20.00	4.35^{a}±0.64	4.78±0.64	71.45±0.43	75.50±0.27	1.92±0.09	0.375^{a}±0.015
T2 (0 Cu×0.5%An)	2439.5±69.50	2.96^{b}±0.47	4.66±0.67	70.60±2.63	74.79±2.02	2.14±0.40	0.325c^{ab}±0.035
T3 (0 Cu×1%An)	2357±143	2.93^{b}±0.29	4.33±0.41	73.75±2.25	77.63±2.01	1.64±0.12	0.340^{ab}±0.020
T4 (50 Cu×0An)	2365±165	3.04^{b}±0.09	3.74±0.33	76.03±2.39	80.30±2.17	2.20±0.22	0.305^{bc}±0.035
T5 (50 Cu×0.5%An)	2454.5±210.5	3.21^{b}±0.09	3.64±0.16	74.21±1.11	78.56±1.01	2.34±0.29	0.270^{c}±0.020
T6 (50 Cu×1%An)	2290.5±20.5	3.17^{b}±0.53	3.72±0.86	71.65±2.40	76.04±1.92	2.23±0.46	0.325^{abc}±0.005
T7 (100 Cu×0An)	2467±112	3.01^{b}±0.21	3.60±0.19	74.32±1.07	78.22±1.13	2.04±0.25	0.270^{c}±0.000
T8 (100Cu×0.5%An)	2506±230	2.99^{b}±0.05	3.66±1.02	73.47±2.20	77.70±1.78	2.30±0.41	0.305^{bc}±0.005
T9 (100 Cu×1%An)	2511±169	2.11^{b}±0.02	4.02±0.85	72.99±0.15	77.39±0.36	2.42±0.50	0.345^{ab}±0.005

*T1 control(zero of curcumin or anise seeds),T2 (zero of curcumin and 0.5% anise seeds),T3 (zero of curcumin and 1% anise seeds),T4(50 mg /kg curcumin and zero anise seeds),T5(50 mg /kg curcumin and 0.5%anise seeds),T6 (50 mg /kg curcumin and 1%anise seeds),T7 (100mg /kg curcumin and zero anise seeds),T8 (100mg /kg curcumin and 0.5% anise seeds),T9 (100mg /kg curcumin and 1% anise seeds).

a –b Means in the same columns with different superscript are significantly different (P>0.05).

The results showed that ther were no significant (P<0.05) effect of curcumin alone on all the previous parameters except heart% and left femur %. An improvement was observed in left femur % for birds fed diets containing curcumin (50, 100 mg/kg), while the heart% decreased at the same order compared to control. Our results are in agreement with Badran et al. (2020) who found that no significant effect was observed on (dressing% ,proventriculus %, gizzard %,carcass yield%) when feeding chicks diets containing curcumin (25,50,100 mg / kg) compared to the control **.**

Regarding the effect of anise seeds, there were statistically significant differences due to anise seeds on the neck% and left tibia% and shank% at 42 days of age. An improvement was observed in shank% and left tibia % for birds fed anise seeds(1%), whereas, the neck% in birds fed anise seeds(0.5%) decreased compared to the control group. Our finding are in the same line with Mohammed, (2019) who reported that there was no significant effect on wings %, liver%, heart% ,gizzard % when feeding chicks with diets containing anise seeds (0.3%, 0.6%, 0.9%) compared to control diet at age of 42 day. Ramadan (2017) reported that there was no significant effect on liver%, heart %,gizzard % when feeding chicks with diets containing anise seeds (0.5, 0.75, 1gm/kg) compared to control.

With regard to the effect of interactions of curcumin and anise seeds, there were statistically significant differences due to interactions between curcumin and anise seeds on the blood%, heart%,

shank%, neck%, left femur% ,left tibia % and alimentary canal% at 42 days of age. However, broiler chickens fed 100 mg/kg of curcumin with 1%anise seeds powder was the highest in left tibia %, while, the broiler chickens fed 100 mg/kg of curcumin was the highest in left femur %. Also, broiler chickens fed 0.5%anise seeds powder were the highest in neck% , while, broiler chickens fed 50 mg/kg of curcumin with 1%anise seeds powder was the highest in alimentary canal%. On the other hand, the blood % decreased for all interactions compared to the control.

Table 9. cont.

Items	Proventriculus%	%Gizzard	Legs%				
			Shanks%	Tibia%		Femur%	
				Right%	Left%	Right%	Left%
Curcumin (mg /Kg):							
0	0.371±0.023	1.79±0.08	3.10±0.12	5.25±0.14	5.40±0.28	8.43±0.22	7.81^{b}±0.24
50	0.336±0.024	1.79±0.05	2.81±0.06	5.05±0.12	5.30±0.14	8.50±0.45	8.69^{a}±0.14
100	0.365±0.017	1.62±0.05	3.02±0.12	5.42±0.14	5.70±0.17	8.07±0.43	8.72^{a}±0.29
Anise seeds (%):							
0	0.353±0.019	1.71±0.07	2.85^{b}±0.09	5.23±0.11	5.48ab±0.18	8.93±0.25	8.49±0.33
0.5	0.351±0.020	1.70±0.07	2.91^{ab}±0.07	5.24±0.14	5.11b±0.17	8.15±0.30	8.46±0.28
1	0.368±0.027	1.79±0.06	3.17^{a}±0.12	5.25±0.19	5.81a±0.18	7.91±0.44	8.26±0.27
Interactions:							
T1 (0 Cu×0An)	0.345±0.062	1.76±0.09	3.01^{ab}±0.23	4.96±0.14	5.55^{ab}±0.61	8.60±0.63	7.61^{b}±0.12
T2 (0 Cu×0.5%An)	0.396±0.031	1.73±0.21	2.96^{ab}±0.13	5.30±0.24	4.85^{b}±0.25	8.50±0.15	7.78^{b}±0.52
T3 (0 Cu×1%An)	0.374±0.041	1.90±0.14	3.34^{a}±0.22	5.48±0.29	5.80^{ab}±0.52	8.18±0.46	8.04^{b}±0.72
T4 (50 Cu×0An)	0.364±0.036	1.78±0.04	2.77^{b}±0.13	5.22±0.04	5.39^{ab}±0.21	9.10±0.09	8.49^{ab}±0.07
T5 (50 Cu×0.5%An)	0.311±0.039	1.75±0.17	2.79^{b}±0.03	5.20±0.06	4.97^{ab}±0.29	8.42±0.44	8.80^{ab}±0.17
T6 (50 Cu×1%An)	0.332±0.065	1.83±0.02	2.89^{ab}±0.16	4.74±0.25	5.55^{ab}±0.10	8.00±1.4	8.80^{ab}±0.43
T7 (100 Cu×0An)	0.352±0.006	1.59±0.19	2.78^{b}±0.10	5.50±0.15	5.50^{ab}±0.28	9.12±0.58	9.39^{a}±0.08
T8 (100Cu×0.5%An)	0.345±0.011	1.64±0.01	2.98^{ab}±0.21	5.23±0.48	5.51^{ab}±0.24	7.54±0.73	8.80^{ab}±0.47
T9 (100 Cu×1%An)	0.398±0.050	1.63±0.01	3.30^{ab}±0.10	5.54±0.07	6.10^{a}±0.29	7.56±0.51	7.96^{b}±0.06

*T1 control(zero of curcumin or anise seeds),T2 (zero of curcumin and 0.5% anise seeds),T3 (zero of curcumin and 1% anise seeds),T4(50 mg /kg curcumin and zero anise seeds),T5(50 mg /kg curcumin and 0.5%anise seeds),T6 (50 mg /kg curcumin and 1%anise seeds),T7 (100mg /kg curcumin and zero anise seeds),T8 (100mg /kg curcumin and 0.5% anise seeds),T9 (100mg /kg curcumin and 1% anise seeds).
a –b Means in the same columns with different superscript are significantly different (P<0.05).

Table 9. cont.

Items	Head%	Neck%	Wings%	%Breast	Alimentary Canal%
Curcumin (mg /Kg):					
0	1.85±0.06	2.07±0.12	7.08±0.23	32.24±0.44	5.99±0.31
50	1.91±0.06	1.83±0.06	6.56±0.22	33.35±0.60	6.36±0.42
100	1.94±0.08	1.91±0.11	6.81±0.15	32.97±0.64	6.06±0.32
Anise seeds (%):					
0	1.80±0.08	1.86^{b}±0.10	6.71±0.17	33.34±0.42	5.81±0.22
0.5	1.94±0.06	2.16^{a}±0.09	6.70±0.26	33.00±0.78	5.92±0.23
1	1.97±0.03	1.78^{b}±0.04	7.04±0.21	32.22±0.41	6.68±0.45
Interactions:					
T1 (0 Cu×0An)	1.72±0.01	2.12 ^{abc}± 0.16	6.54^{b}±0.09	32.76±1.43	5.85 ^{ab}± 0.09
T2 (0 Cu×0.5%An)	1.85±0.10	2.32^{a}±0.09	7.09 ^{ab}± 0.47	32.19±0. 50	6.52 ^{ab}± 0.23
T3 (0 Cu×1%An)	1.99±0.09	1.78 ^{cd}± 0.02	7.61^{a}±0.07	31.78±0.34	5.62^{b}±0.98
T4 (50 Cu×0An)	1.90±0.24	1.74 ^{cd}± 0.08	6.97 ^{ab}± 0. 47	33.60±0.04	6.10 ^{ab}± 0.72
T5 (50 Cu×0.5%An)	1.89±0.02	1.95 ^{bcd}± 0.12	6.05^{b}±0.23	34.78±0.52	5.55^{b}±0.34
T6 (50 Cu×1%An)	1.94±0.04	1.79 ^{cd}± 0.10	6.68 ^{ab}±0.02	31.69±0.50	7.43^{a}±0.42
T7 (100 Cu×0An)	1.77±0.18	1.73 ^{d}± 0.10	6.62 ^{ab}± 0.30	33.68±0.29	5.49^{b}±0.05
T8 (100Cu×0.5%An)	2.09±0.07	2.23 ^{ab}± 0.16	6.98 ^{ab}± 0.30	32.05±1.97	5.70^{b}±0.30
T9 (100 Cu×1%An)	1.97±0.01	1.78 ^{cd}± 0.10	6.83 ^{ab}± 0.30	33.19±0.88	6.99^{ab}±0.37

*T1 control(zero of curcumin or anise seeds),T2 (zero of curcumin and 0.5% anise seeds),T3 (zero of curcumin and 1% anise seeds),T4(50 mg /kg curcumin and zero anise seeds),T5(50 mg /kg curcumin and 0.5%anise seeds),T6 (50 mg /kg curcumin and 1%anise seeds),T7 (100mg /kg curcumin and zero anise seeds),T8 (100mg /kg curcumin and 0.5% anise seeds),T9 (100mg /kg curcumin and 1% anise seeds).
a –b Means in the same columns with different superscript are significantly different (P<0.05).

CONCLUSIONS

It was recommended that curcumin as a medical herbs extract should be added at either 100 mg/kg diet or 50 mg/kg curcumin plus 1% anise ground seeds to achieve higher growth performance and improve some carcass characteristics of broiler chicken (Ross 308).

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تأثير إضافة بعض الأعشاب الطبية او مستخلصاتها على الاداء والوظائف الفسيولوجية في كتاكيت اللحم.

٢- تأثير مستويات الكركمين و بذور الينسون المطحون والتداخل بينهما على معدل أداء النمو وصفات الذبيحة في دجاج التسمين.

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صممت هذه الدراسة لمعرفة تأثير مستويات الكركمين و بذور الينسون والتداخل بينهما على أداء النمو وبعض صفات الذبيحة لدجاج التسمين .تم اختيار مائتان وسبع وتسعون كتكوت تسمين من سلالة روس 308عشوائياً في تجربة عاملية .(3 × 3) تم استخدام ثلاثة مستويات من الكركمين (٠ ، 50، 100ملجم /كجم علف) وثلاثة مستويات من بذور الينسون المطحونة (٠، 0,5٪،1٪ في العلف) في تسعة معاملات لكل منها 33طائر ثلاثة مكررات لكل منها 11طائر .تم قياس وزن الجسم وكمية العلف اسبوعيا وبالتالي تم حساب الزيادة في الوزن ومعدل التحويل الغذائي .وفي نهاية التجربة تم ذبح ثلاثة طيور من كل مجموعة لقياس أجزاء الذبيحة .أظهرت النتائج ان الطيور الذى تم تغذيتها بالكركمين 100مجم/كجم من العلف حققت أعلى وزن جسم عند عمر 14يوم وكذلك الزيادة في وزن الجسم خلال الفترة 14-7يوم عن مجموعة(الكنترول)أيضا استخدام 1% من بذور الينسون المطحون ادى الى زيادة العلف المستهلك في الفترة من 28-21يوم بالمقارنة بمجموعة الكنترول .استخدام مستوى 50 ملجم/كجم من الكركمين في العلف مع بذور الينسون المطحونة بمستوى 1%أدت الى تحقيق أعلى استهلاك للعلف خلال الفترة من 21-14و-21 28يوما مقارنة بالمعاملات الأخرى .لا يوجد تأثيرات معنوية ($P<0.05$)على نسبة التحويل الغذائي يعزى الى الكركمين أو بذور الينسون المطحونة والتداخل بينهما .كان هناك تأثير معنوي ($P<0.05$) يعزى لمستويات الكركمين على القلب والفخذ اليسرى .ايضا هناك تأثير معنوي ($P<0.05$)لبذور الينسون على الساق والدبوس الايسر والرقبة .يوصى بإضافة الكركمين عند مستوى 50أو 100مجم /كجم من العليقة أو استخدام مخلوط من 50مجم /كجم من الكركمين مع 1٪ من بذور اليانسون المطحون لتحقيق افضل معدل أداء النمو واحسن مقاييس للذبيحة لدجاج التسمين روس (٣٠٨).