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EFFECT OF PARTIAL REPLACEMENT OF SOYBEAN MEAL WITH GUAR MEAL ON PERFORMANCE AND CARCASS TRAITS ON BROILER CHICKENS

M. Tammam; S.A. Ibrahim; A.I. El-Faham and A.A. Hemid

Poultry production Dept., Fac. of Agric, Ain Shams Univ., Cairo Egypt.

SUMMARY

The present study was carried out at the experiment farm of faculty of agriculture, Ain Shams University. The aim of this experiment was to evaluate the effect of inclusion of guar meal (G) as a partial or total replacement for soybean meal (SM) in broiler diet on production performance and carcass traits of Ross broiler chickens.

At 7 days of age, 125 unsexed broiler chicks (Ross 500) were divided into 5 treatments (25 birds each). Each treatment contained 5 replicates of 5 chicks each. The experimental treatments were: control diet (100% soybean meal, SM), T1 (87.5% SM+12.5% G), T2 (75%SM+25%G), T3 (50% SM+50% G) and T4 (100% G).

Results obtained could be summarized as follows:

1- Replacement SM with G in broiler chick diets had a significant effect on live body weight gain, feed intake and feed conversion ratio.
2- Chicks fed 100% G diets gave the lowest results in live body weight gain, feed consumption and feed conversion ratio.
3- Replacement SM with G in broiler chicks gave significant effect regarding slaughter parameters, carcass parts (%), digestive tract length (cm/100g BW), some bone traits and some blood parameters.
4- Broiler chicks fed diets containing different levels of G gave the lowest economic and relative efficiency values when compared with the control.

Generally, using guar meal as a replacement for soybean meal at the tested levels in this study may not be beneficial under practical conditions and further research is needed to determine a more accurate level of inclusion of guar meal for better performance and carcass characteristics.

Keywords: *Guar meal, broiler chicks, carcass characteristics and performance.*

INTRODUCTION

Feeding cost is considered the most expensive (60 to 70%) in the whole poultry production process. The key for successful process in poultry projects is through minimizing the feed cost. Using unconventional cheap feed ingredient alternatives to replace traditional expensive feed ingredients in poultry diets has become of a major economic interest for poultry nutritionists worldwide.

Guar (Gyamopsistetragonoloba) is a drought resistant annual legume predominantly grown in India and Pakistan (Apeda, 2011). The plant is primarily grown for its galactomannan polysaccharide gum which has numerous industrial and food processing applications (Hassan *et al.*, 2008). Guar gum is a highly viscous used primarily as a thickening agent and is used as a stiffener in soft ice cream, a stabilizer for cheeses, instant puddings and whipped cream substitutes (Lee *et al.*, 2003 a, b).

Guar meal (GM) is a by-product of the isolation of guar gum (GG) from guar bean. The guar meal is obtained after the mechanical separation from both hulls and germs of guar seed. It contains higher energy, phosphorus, protein (35-60%), lysine and methionine than in soybean meal, addition of guar meal as a partial replacement for soybean meal in poultry diets may be a useful economic strategy for decreasing feed costs while maintaining production levels.

Verma and McNab (1984) reported that approximately 88% of the nitrogen content in GM was true protein, with an arginine content approximately twice as soybean meal, although the methionine and lysine contents have been reported to be inadequate for optimal rate growth (Van Etten *et al.*, 1961).

On the other handsome of the anti – nutritional agents in guar meal limit the usage of high levels of this meal in broiler diets. Guar gum, tripsin inhibitor, saponins, polyphenols and hemagelotenins are some of the anti – nutritional agents in guar meal (Verma and Mcnab, 1982; Conner, 2002; Lee *et al.*, 2003a and Mohayayee and Karimi, 2011).

GM contains about 18% residual GG (Lee *et al.*, 2004) and about 5.0% crude saponin by weight of the dry matter basis (Hassan *et al.*, 2010).

Lee *et al.* (2003 a, b) found that the GG residues in meal can increase the viscosity of digester, thereby reduce the growth and feed efficiency. Gum residue increases intestinal viscosity, which decreases the nutrient absorption in gastrointestinal tract (Rainbird *et al.*, 1984), reduce glucose absorption up to 35% and water absorption up to 40%.

Ingredients in broiler diets that cause increased intestinal viscosity, such as barley, rye, and wheat, are cited as the cause of growth inhibition and poor feed efficiency (Choct *et al.*, 1995).

Inclusion of guar meal into broiler chicken diets deleteriously affects measures of growth and performance at levels over 2.5% (Conner, 2002). An inverse relationship between feeding level of guar meal and growth performance was reported by Thakur and Pradhan (1975), who fed guar meal at 0, 7.5, and 15% of the diet. These finding were supported by the work of Patel and McGinnis (1985), who indicated that inclusion of higher levels (15%) of guar meal more negatively affected body weight gain and feed efficiency than the 10% inclusion rate.

It is not yet clear which percentage of GM could be added to broiler chicken diets without adverse effects on their productive performance.

No data is available in the scientific literature directly to study the effects of partial or total substitution of soybean meal with guar meal in broiler diets. Therefore, the objective of our current research was to evaluate the effects of inclusion of guar meal as a partial or total replacement for soybean meal in broiler diets on production performance and carcass traits of ROSS broiler chickens.

MATERIALS AND METHODS

This experiment was carried out in the experimental farm of Faculty of Agriculture, Ain Shams University. One hundred and twenty five unsexed broiler chicks (Ross 500) were randomly allocated to five treatments of 25 birds each in five replicates (5 chicks / replicate). Chicks were reared in electrics heated batteries under similar conditions of management during the experimental period (35 day of age). The experimental treatments were as follows: control diet (100% soy bean meal, SM), T1 (87.5%SM+12.5%GM), T2 (75%SM+25%GM), T3 (50%SM+50%GM), T4 (100% guar meal, GM). The nutrient requirements for broiler chicks were covered (Table 1).

Chicks were individually weighted to the nearest gram at weekly intervals during experimental period. At the same time, feed consumption was recorded and feed conversion ratio (FCR, g/ feed /g gain) and live body weight gain were calculated. Mortality was recorded daily.

At the end of the experimental period (35 day of age), three chicks from each treatment were randomly selected ,weighted and slaughtered for determination of carcass characteristics % (carcass, giblets, ready to cook and abdominal fat) ; carcass parts (breast, thigh, drumstick and wing) and some bone traits (seedor index (SI) and tibia breaking strength(Kg/cm^2)[3].

Individual blood samples were collected and centrifuged at 4000 rpm for 10 minutes, and plasma was separated and kept in refrigerator for chemical analysis. Quantitative determinations of blood plasma were carried as follows: total protein according to Gornall *et al.*(1949), albumin according to Doumas *et al.* (1971), globulin was determined by subtraction the value of albumin from the value of total protein, AST and ALT both were determined using the method described by Reitman and Frankel (1957), total cholesterol by the enzymatic colorimetric method described by Richmond (1973) and triglycerides by the method described by Fassati and Prencipe (1982).

To determine the economic efficiency for meat production, the amount of feed consumed during different experiment period was obtained and multiplied by price of one Kg of each experimental diet which was estimated based upon local current price at the experimental time.

Statistical analysis was conducted using the General Linear Model (GLM) procedure of base SAS® (SAS Institute, 1995). Factors tested in analysis included all experimental parameters using one way ANOVA. Means were compared using Duncan's multiple range test (Duncan, 1955) where the level of significance was set at minimum ($P \leq 0.05$). Dietary treatments (T) were assigned as the main factor. The statistical model performed was as follow:

$Y_{ik} = \mu + T_i + E_{ik}$

Y_{ik} = an observation

μ = Overall mean

T_i = effect of treatment

E_{ik} = random error

Table (1). Composition and calculated analysis of starter, grower and finisher experimentaldiets:

Ingredients	Starter diets From 7 to 21 day-old					Grower diets From 22 to 28 day-old					Finisher diets From 29 to 35 day-old				
	Treatments					Treatments					Treatments				
	con	T1	T2	T3	T4	con	T1	T2	T3	T4	con	T1	T2	T3	T4
Yellow corn	55.02	55.75	55.90	56.10	56.60	59.27	59.94	60.20	60.3	60.35	63.51	63.99	64.125	64.45	64.45
Soybean meal 48%	38.75	33.60	28.70	19.00	0.00	33.90	29.40	25.00	16.60	0.00	29.10	25.40	21.70	14.25	0.00
Guar meal*	0.00	4.75	9.50	19.00	38.00	0.00	4.15	8.30	16.60	33.20	0.00	3.56	7.125	14.25	28.50
Soy bean oil	2.30	2.10	2.10	2.10	2.10	3.00	2.80	2.80	2.80	2.75	3.90	3.70	3.70	3.70	3.70
Bone meal	3.00	3.00	3.00	3.00	3.00	2.60	2.60	2.60	2.60	2.60	2.30	2.30	2.30	2.30	2.30
Limestone	0.20	0.20	0.20	0.20	0.20	0.50	0.50	0.50	0.50	0.50	0.45	0.45	0.45	0.45	0.45
Premix (min.+vit.) **	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Natural salt	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
DL Methionine	0.13	0.00	0.00	0.00	0.00	0.13	0.01	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00
Calculated analysis:															
ME(Kcal/Kg diet)	2982	2983	2988	2998	3012	3064	3065	3070	3078	3088	3164	3163	3166	3176	3187
Crud protein (%)	23.06	22.99	23.00	23.05	23.30	21.03	20.98	20.93	21.01	21.24	19.03	19.05	19.09	19.01	19.21
C/P ratio	129.3	129.8	129.9	130.0	129.2	146.1	146.0	146.6	146.5	145.3	166.2	166.2	165.8	167.0	165.8
Calcium (%)	1.01	1.00	0.98	0.96	0.91	1.00	0.99	0.98	0.95	0.91	0.89	0.88	0.87	0.85	0.81
Av. Phosphorus (%)	0.50	0.49	0.48	0.46	0.41	0.45	0.45	0.43	0.41	0.37	0.40	0.40	0.39	0.37	0.34
Methionine (%)	0.55	0.52	0.63	0.84	1.25	0.52	0.50	0.58	0.76	1.12	0.51	0.46	0.53	0.69	0.99
Lysine (%)	1.38	1.34	1.30	1.24	1.11	1.23	1.20	1.17	1.11	1.00	1.09	1.07	1.04	0.99	0.89

** Control= (100%SM), T1 (87.5%SM+12.5%GM), T2 (75%SM+25%GM), T3 (50%SM+50%GM), T4 (100%GM), SM : soy bean meal, GM : guar meal.*

***Composition of vitamin and minerals premix. Each 3 kg of premix containing: 15000000 I.U VIT. A, 50 g. VIT.E, 3000 mg. VIT.K3, 3000 mg. VIT.B1, 8000 mg. VIT.B2, 4000 mg. VIT.B6, 20 mg. VIT. B12, 15000 mg. Pantothenic acid, 60000 mg. Niacin, 1500 mg. Folic acid, 200 mg. Biotin, 200000 mg vit C, 700 gm. Choline chloride, 80 gm. Mn, 80 gm. Zn, 60 gm. Iron, 10 gm. Cu, 1 gm. Iodine , and 0.2 gm. Selenium , where CaCo3 was taken as a carrier up to 3kg, the inclusion rate was 3kg premix / Ton feed.*

RESULTS AND DISCUSSION

Productive performance:

Live body weight gain:

The live body weight gain of broiler chicks as affected by dietary treatments are illustrated in Table (2). It is worth to note that the chicks fed 100% GM diets (T4) during studied periods (7-21, 22-28, 29-35 and 7-35 day old) gave the lowest significant ($P \leq 0.01$) resulted for live body weight gain compared with other treatments. However, during the whole experimental period (7-35 day), chicks decreased by 79% (348 versus 1642 g) compared with control group.

On the other hand, chicks fed 4.75 % GM (T1) gave highest live body weight gain (1462g) compared to the those fed diets containing highest levels of 9.5 or 19%, which recorded 1350 and 851, respectively. The differences were statistically significant. These results are in agreement with those reported by Mohayayee and Karimi (2011); Conner (2002); Gutierrey *et al*. (2007); Lee *et al.* (2003a,b), Lee *et al.* (2005) and Kamran *et al.* (2002).Their results indicated that, galactomannan gum content in guar meal can increase intestinal viscosity which suppress growth and reduce feed efficiency.

In the same trend, Hassan (2013) concluded that, there are more negative effects associated with adding guar saponins than guar gum and suggested that saponins may play a prominent role in the growth inhibition effect on feeding guar meal to broiler chicks.

During the finishing period (29-35day), chicks fed high levels of GM (T3 and T4) were significantly ($P \leq 0.01$)gave lower live body weight gain than control and the relative reduction in live body weight gain was 238 and 440 g. , respectively(Table2). However, the depression in growth performance due to the effect of the poor nutritive value of the diet was more pronounce during starting rather than finishing periods. This might be due to the fact that, older birds have more tolerance and more adaptation for feed deficiency than young birds (Lesson and Summers, 1991). On the same order, Vermaand and McNab (1982) found that there were negative effects of guar meal which were more prominent in younger birds than older ones.

Responses of chicks to diets containing GM (T1-4) showed that chicks fed diets containing 4.75% GM supported the highest body weight gain than those fed the three other highest levels (9.5, 19.0 and 38.0%). The corresponding figures were 1462, 1350, 851and 348g, respectively. The differences were significant compared with those fed control diet. Similar observation was reported by Thakur and Pradhan (1975) and Patel and McGinnis (1985), who indicated that high inclusion levels of GM markedly decrease growth, feed intake and feed efficiency and found that 10% inclusion of guar meal decreased body weight in week 1 to 4but not at week 7. However, the feed: gain ratio was increased overall at 10% inclusion. Inclusion at 15% resulted in reduced performance throughout the study with low final body weight and highest feed: gain ratios.

Feed consumption and feed conversionratio:

Data in Table (2) indicated that feed consumption per bird (g) and feed conversion ratio significantly ($P \leq 0.01$) differences by feeding GM diets compared with those fed control diets. On the other hand, the effect of the GM at levels 4.75 (T1) and 9.50% (T2) showed that no significant differences on feed consumption and feed conversion. Chicks fed diets containing 19.0 and 38.0% GM (T3 and T4) feed consumption reduced significantly ($P \leq 0.01$) compared to control. It was obvious from (Table 2) that the effect of GM on feed conversion during starting, finishing and whole experiment period (7-35 day) increased and the differences failed to be significant. This may be due to the fact that unpalatability of the diet and to its highest anti-nutritional agents in guar meal. The increase of feed intake in broiler fed high guar treatments indicated that there were some unfavorable characteristics in guar meal by-products and these characteristics were not enough for reduction feed intake in broiler when added at low levels, which is supported by previous data (Gutierrez *et al.*, 2007). Feed conversion ratio for broilers fed high GM (6,9 and 12% in started, grower, and finisher diets, respectively) were significantly highest than for the control group, although, no significant differences were detected among low levels of GM (2,4 and 6% in starter, grower and finisher diets respectively) Mohayayee and Karimi (2011).

Table (2). Effect of feeding different dietary treatments on growth performance of broiler chicken at different experimental periods.

Items	Treatment*						Sig
	CO	T1	T2	T3	T4	S.E	
Initial body weight (g)							
7 day-old	128.84	129.08	129.24	128.68	129	±0.38	NS
Body weight gain(g)							
7-21day-old	468a	435ab	400b	210c	95d	±21	**
22-28day-old	613a	519b	494b	319 c	132d	±26	**
29-35 day-old	560a	507b	456b	322c	119d	±20	**
7-35day-old	1642a	1462b	1350b	851c	348d	±41	**
%	100	89	82	52	21		
Feed consumption(g)							
7-21day-old	983a	960a	980a	809b	739b	±48	**
22-28day-old	894a	730ab	829a	576b	208c	±53	**
29-35 day-old	1086a	1187a	1087a	729b	419c	±48	**
7-35day-old	2964a	2878a	2897a	2115b	1367c	±86	**
%	100	97	98	71	46		
Feed conversion (g .feed/g .gain)							
7-21day-old	2.13b	2.21b	2.46b	3.99b	8.17a	±0.69	**
22-28day-old	1.46	1.39	1.68	1.80	2.43	±0.50	NS
29-35 day-old	1.93b	2.42b	2.35b	2.30b	3.61a	±0.19	**
7-35day-old	1.80b	1.97b	2.15b	2.48b	4.14a	±0.28	**
%	100	109	119	138	230		
Mortality (%)							
7-35day-old	0/25	0/25	0/25	0/25	0/25	0	NS

**Control= (100%SM), T1 (87.5%SM+12.5%GM), T2 (75%SM+25%GM), T3 (50%SM+50%GM), T4 (100%GM), SM : soy bean meal, GM : guar meal.*
*Means within the same row with different superscripts are significantly different. Sig=Significance** (P≤0.01), * (P≤0.05). NS=Non Significance.*
Carcass characteristics

Healthy condition and Mortality rate:

Under the condition of the present study, all chicks appeared healthy and total mortality rate was 0.0% during the total experimental period (7-35 day), without differences among treatments. Similar observation were reported by Abhijit Mishra *et al.* (2013) who concluded that feeding broilers chicks GM as a replacement of soybean meal had no adverse effect on mortality rate and there was no significant variation observed between the groups. On the other hand, these findings are in contracted with the results obtained by Kamran *etal.* (2002) who reported that the mortality rate has an increasing trend at 15% guar meal in diets.

Table (3) shows the effect of GM on carcass characteristics for the chicks at the end of 35 day of age. Experimental treatments with GM (T1-4) had significant effect (P≤ 0.01) on studied parameters compared with control. The corresponding values for carcass% ranged between 72.93 and 58.69%, while ready to cook (carcass weight + giblets weight) percentage ranged between 74.41 and 64.48%, Abdominal fat percentage ranged between 1.73 and 0.21%. And Breast percentage ranged between29.72 and 18.90%.

On the other hand, the birds fed high levels of GM (T4) gave the lowest figures of 58.69, 64.48, 0.21 and 18.90% for carcass, ready to cook, abdominal fat and breast percentage respectively and differences were significant (P ≤ 0.01) compare with control.

However, adding the GM at 4.75% as inclusion rate in broiler diets showed a little insignificant reduction figures compared with control.

Similar observation have been reported by Kamran *etal.* (2002) and Lee *etal.* (2005) they reported that, use of low levels of GM in broilers feeding resulted in higher carcass weight, breast weight, and breast efficiency than broiler fed with higher levels of GM.

Digestive track length (cm/100g BW), DTL and some bone traits (seedor index (SI) and tibia breaking Strength (Kg/cm^2)^{3}TBS showed the same trend since broiler chicks fed highest level of GM (T4) reflected the highest in DTL and lowest results in both SI and TBS. Compared with control group.

The corresponding figures were 36.89 cm/100g BW, 0.35 and 12 Kg/cm^{2,} respectively and the differences were significant compared with those fed control diets.

Responses of chicks fed diets containing GM (T1-4) showed that chicks fed diets containing (4.75 or 9.50%) supported the lowest DTL and highest SI and TBS than those fed the two other highest levels (19 or 38 %) and the differences failed to be significant ($P \leq 0.01$). these results are in agreement with those obtained by Abhijit Mishra (2013) and Smits *etal.* (1997) they reported that, intestinal length was highest in the birds fed with guar Korma and increased intestinal viscosity induced by the galactomannan of guar may be the reason for the longer DTL.

Table (3). Effect of different dietary treatments on carcass characteristics and carcass parts as a % of live body weight of broiler chicken at 35 day-old.

Items	Treatments*					S.E	Sig
	Co	T1	T2	T3	T4		
Carcass characteristics %							
Carcass	72.93^{a}	68.16^{ab}	65.56^{cb}	63.72^{c}	58.69^{c}	±2.18	*
Liver	1.86^{c}	2.40^{bc}	2.40^{bc}	2.53^{b}	3.14^{a}	±0.19	*
Gizzard	1.18^{c}	1.37^{c}	1.48^{bc}	1.99^{ab}	2.16^{a}	±0.11	**
Heart	0.43^{c}	0.58^{b}	0.56^{bc}	0.71^{a}	0.48^{bc}	±0.04	**
Giblets	3.47^{c}	4.35^{b}	4.45^{b}	5.23^{a}	5.78^{a}	±0.23	**
Ready to cook**	76.41^{a}	72.51^{ab}	70.02^{ab}	68.96^{ab}	64.48^{b}	±2.09	*
Abdominal fat	1.68^{ab}	1.73^{a}	1.48^{ab}	0.96^{b}	0.21^{c}	±0.18	**
Carcass parts %							
Breast	29.72^{a}	28.63^{ab}	23.24^{ab}	19.11^{b}	18.90^{b}	±2.20	*
Drumstick	8.75^{a}	7.84^{ab}	8.23^{ab}	6.99^{bc}	6.52^{c}	±1.54	**
Thigh	17.51	15.64	12.93	13.04	12.91	±1.20	NS
Wing	7.37^{a}	6.45^{b}	6.48^{b}	7.03^{ab}	7.58^{a}	±0.16	**
Digestive track length (cm/100g BW)	11.12 d	13.93 c	15.27 c	23.47 b	36.89 a	±0.51	**
%	100 d	125c	137c	211b	331a	±3.07	**
Some bone traits							
Seedor index***	0.74^{a}	0.66^{a}	0.72^{a}	0.45^{b}	0.35^{b}	±0.08	**
Tibia Breaking Strength(Kg/cm^{2})^{3}	30.66^{a}	27.33^{a}	32.33^{a}	27.00^{a}	12.00^{b}	±2.50	**

** Control= (100%SM), T1 (87.5%SM+12.5%GM), T2 (75%SM+25%GM), T3 (50%SM+50%GM), T4 (100%GM), SM: soy bean meal, GM: guar meal.*

*** Ready to cook (carcass weight +giblets weight)*

****Seedor index (tibia dry weight (in grams) is divided by its length (in centimeters))*

*Means within the some row with different superscripts are significantly different. Sig=Significance** ($P\leq0.01$), * ($P\leq0.05$). NS=Non Significance.*

Blood parameters:

Table (4) shows the effect of GM on some blood plasma constituents of broiler chicken at 35 day old of age.In the present study different dietary treatments caused significant differences in some blood parameters, Total Protein, Globulin, A/G ratio, Triglycerides, Cholesterol and ALT activity.

Total protein and Globulin concentration recorded highest significant levels for chicks fed low levels of GM (T1) compared with the other treatments. The explanation of that could be related to increase the rate of protein metabolism or the poor utilization of digested protein by the body tissues (Berrong and Washburn 1998). Although, there is significant difference among treatments in A/G ratio values and best rations were recorded by control and T1 treatments. Regarding lipid metabolites, low GM diets (T1) increased Cholesterol and Triglycerides by 45 and 29% on average compared to the control treatment. Also ALT activity has significantly different among treatments groups and the highest values were found for chicks fed 19%GM diets (T3) than those fed other treatment diets. These results are in general agreement with those reported by Mohayayee and Karimi (2011), who reported that, intermediate and high GM diets increased plasma Triglycerides by 7% and plasma Cholesterol concentration compared to the control group.

Economical Evaluation:

Data for economical evaluation are summarized in Table (5). The price figures are based on the recent prices of local market for ingredients and selling price of chickens in Qaliobeya region, Egypt.

It was clear that using GM in broiler diets (starter, grower and finisher), T1-4 relatively reduced the total feed cost / chick compared with the control. The cost reduction were more pronounced by using high levels of GM and the corresponding reduction values were 6, 7, 34 an 62%, respectively.

However, the obtained results showed that adding GM at different levels T1-4 on the expense of soybean meal resulted in reduction of the calculated economic efficiency percentages compared with control. This might be due to the lowest productive performance figures (body weight and feed conversion) and the corresponding reduction values were 14, 27, 62 and 121% respectively. These results are in agreement with the results of Kamran*etal.* (2002), who found that as the level of GM increased in diets the price decreases but at the same time cost per Kg of live body weight increased.

Table (4). Effect of different dietary treatments on some blood plasma constituents of broiler chicken at 35 day-old.

Items	Treatments						
	Co	T1	T2	T3	T4	S.E	Sig
Total protein (g/dl)	3.85b	6.63a	3.10b	2.88b	3.47b	±0.04	**
Globulin (g/dl)	1.82b	4.72a	1.23b	1.13b	1.62b	±0.51	*
A/G ratio	0.80ab	0.36b	0.97ab	1.84a	1.32ab	±0.27	**
Cholesterol (mg/dl)	96.33bc	139.88a	89.01c	130.82a	107.90b	±4.09	**
Triglycerides (mg/dl)	65.88^{a}	85.09^{a}	70.98^{a}	61.17^{a}	49.41^{b}	±2.85	*
ALT(μ/dl)	5.31^{bc}	6.68^{b}	3.24^{bc}	11.07^{a}	2.30^{c}	±0.98	**

** Control= (100%SM), T1 (87.5%SM+12.5%GM), T2 (75%SM+25%GM), T3 (50%SM+50%GM), T4 (100%GM), SM: soy bean meal, GM: guar meal.*

Table (5). Effect of feeding different dietary treatments on economical evaluation.

Items	Dietary treatments				
	Control	T1	T2	T3	T4
Live body weight (Kg)	1.771	1.591	1.480	0.980	0.477
Price/Kg body weight(L.E)	13	13	13	13	13
Total revenue/chick (L.E)	23.02	20.68	19.24	12.74	6.20
Total feed intake/ chick(Kg)	2.965	2.878	2.898	2.115	1.367
Total feed cost/ chick (L.E)	8.92	8.36	8.25	5.85	3.42
%	100	94	93	66	38
Fixed cost/ chick (L.E)	4	4	4	4	4
Total cost/ chick (L.E)	12.92	12.36	12.25	9.85	7.42
Net revenue(L.E)	10.10	8.32	6.99	2.89	-1.22
Economic efficiency (EE)	78.17	67.31	57.06	29.34	-16.44
Relative	100	86	73	38	-21

CONCULUSION

It is concluded from the present study, that replacing soybean meal with guar meal at the rate of o. 4.75, 9.50, 19.0 and 38.0% in starter, grower and finisher diets resulted in poorer body weight gain, feed conversion and economic efficiency. Plausibly, the residual indigestible polysaccharides, suchβ-galactomannan present in the guar meal increased the intestinal viscosity and inhibited the performance of broiler. In summary guar meal as a replacement for soybean meal at the levels tested in this study may not be beneficial under practical conditions and that further research is warranted to determine a more accurate level of inclusion of guar meal for better performance and carcass yields of birds.

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تاثير الاستبدال الجزئى اوالكلى لكسب فول الصويا بكسب الجوار على الاداء الانتاجى وصفات الذبيحه والعائد الاقتصادى لبدراى التسمين.

احمد محمد تمام، سيد عبد الرحمن ابراهيم، احمد ابراهيم سليمان الفحام و علاء الدين عبد السلام حميد.

قسم انتاج الدواجن-كلية الزراعه-جامعة عين شمس- مصر.

اجريت التجربه فى المزرعه التجريبيه الخاصه بكلية الزراعه جامعة عين شمس.بغرض التعرف على تاثير الاستبدال الجزائى اوالكلى لكسب فول الصويا (الصويا) بكسب الجوار (الجوار) على الاداء الانتاجى وصفات الذبيحه والعائد الاقتصادى لبدراى التسمين.

استخدم 125 كتكوت تسمين عمر 7 ايام من سلالة (ROSS 500) قسمت الطيور على 5 معاملات غذائيه (25 طائر/ مكرره) كما يلى:

كنترول (100% صويا), معامله T1 (87.5% صويا : 12.5% جوار)), معاملهT2 (75% صويا : 25% جوار), معاملهT3 (50% صويا 50% جوار), معاملهT4(100% جوار).

وتتلخص النتائج المتحصل عليها فيما يلى:

1- استبدال كسب فول الصويا بكسب الجوار فى علائق بدارى التسمين اثر معنويا على وزن الجسم المكتسب و العلف المستهلك ومعامل التحويل الغذائي.
2- بدارى التسمين المغذى على 100% كسب الجوار اظهرت اسواء النتائج لوزن الجسم المكتسب واستهلاك ومعامل تحويل الغذائى.
3- استبدال كسب الفول الصويا بكسب الجوار اثر معنويا على صفات الذبيحه, % لقطعيات الذبيحه, طول القناه الهضميه لكل 100 جراموزن حى, بعض صفات العظم, بعض صفات الدم.
4- بداري التسمين (ROSS 500) المغذاه على نسب مختلفه من كسب الجوار اعطت اقل كفاءة اقتصاديه واقل كفاءة اقتصاديه نسبية مقارنة بمجموعة الكنترول.

من هذه النتائج يمكن استنتاج ان كسب الجوار لم يعطى نتائج مرضيه عند استبدال كسب الفول الصويا بالمعدلات المفترضه فى هذهالتجربه ونحتاج الى المزيد من الابحاث لتجربة معدلات اخرى لا تؤثر سلبيا على الاداء الانتاجى وصفات الذبيحه لبدرى التسمين.