PARTIAL OR TOTAL REPLACEMENT OF SOYBEAN MEAL BY GUAR MEAL ON GROWTH PERFORMANCE AND ECONOMIC EVALUATION OF BROILER CHICKENS

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(Received 22/9/2023, accepted 1/11/2023)

SUMMARY

An experiment was conducted to determine the effect of partial or total switching soybean meal (SM) by Guar meal (GM) in broiler diets (started, grower, and finisher1) 7-35 days of age and feed all birds (SM) in (finisher2) diet 36-42 days of age on productive performance, carcass characteristics, and economical evaluation of broiler chicks. Five levels of GM representing [control (100% SM + 0.00% GM), T1= 87.5% SM+12.5% GM, T2=75% SM+25% GM, T3=50% SM+50% GM and T4=0.00% SM+100% GM] during starter (7-21 days), grower (22-28 days) and finsher1 (29-35 days) stages then all broiler chicks fed on finsher2 diets (36- 42 days, 100% SM). 7 days- old 125 Ross broiler chicks (housed 5 birds/cage) were allotted into the five treatments, each containing 25 chicks in 5 replicates per treatment. Body weight (BW) and feed intake (FI) were recorded and body weight gain (BWG) and feed conversion ratio (FCR) were calculated. Feed and water were supplied ad-libtum. At the end of experiment, 3 birds from each treatment were randomly selected and slaughtered for carcass measurements.

The results showed that:

- Body weight (BW), Body weight gain (BWG) and feed intake (FI) linear decrease with increase GM concentration in diets during experimental period (7-42) days of age and, in turn, caused whole linear increase in feed conversion ratio (FCR) values.
- Dietary supplementation of GM had no effects on the relative weight of carcass characteristics except gizzard% and giblets%.
- Dietary supplementation of (GM) had significant effects on the figures of tibia and plasma parameters except Albumin and GOT.
- Price of kg feed and feed intake cost liner decrease with increase GM concentration, however; relative economic efficiency (REE) was decreased with increasing the levels of GM in broiler diets.
- Broiler chickens fed (87.5% SM+12.5%GM, T1) gave the best results of BW, BWG, FI, FCR and REE, without any adverse effect on carcass and bone traits and some blood plasma parameters.
- Conclusion: Guar meal can be used as a replacement for soybean meal at level of (87.5% SM+12.5%GM) in broiler diets from (7-35) days then fed on (0.00 GM) up to 42 days of age for better performance, carcass characteristics and relative economic efficiency.

Keywords: *Broiler, soybean meal, guar meal, performance, and carcass characteristics.*

INTRODUCTION

The greatest part of the costs of the poultry industry is represented in the feeding costs, which represent 70% of the total production costs. Recent days the traditional feedstuffs be more expensive so it's be important to found another feedstuffs cheaper than traditional feed stuffs (Thirumalaisamy *et al.*, 2016). Guar meal (GM) is a by-product of the isolation of guar gum (GG) from guar bean. GM consists of a mixture of germ and hull fractions (Rahman and Leighton, 1968). Guar meal is one of untraditional feedstuffs which containing high protein (35-60%) (Tammam *et al.*, 2015). Guar meal defects its containing of some anti-nutritional factors such as saponins, trypsin inhibitor and guar gum which remains in meal after gum extraction (Kamran *et al.*, 2002; Lee *et al.*, 2005 and Gutierrez *et al.*, 2007).

Turki *et al.* (2011) investigated the effect of feeding various through levels (0%, 5%, 15% and 25%) of guar germ on broiler chick's performance 7 weeks who found that birds received 5% guar germ had significantly increase body weight gain compared with control and other treatments. However, Hassan (2013) found during the first 21 day old 5% guar meal recorded a significant lower body weight gain compare with control group (0.00 guar meal). Also, Lee *et al.* (2005) used different levels of guar meal with levels 2.5, 5.0, 7.5, and 10.0% in broiler diet to investigate those effects on broiler performance and found that body weight was significantly different between dietary treatments. On the other side, Lee *et al.* (2005) reported that using of low levels of guar meal germ fraction in broiler's feeding resulted in higher carcass weight, breast weight and breast efficiency than broilers fed with higher levels of this meal that were similar with the results of present research.

Mohayayee *et al.* (2011) studied the effect of β-mannanase enzyme on a commercial broiler chickens strain fed with different levels of guar meal germ fraction (GM). Broiler chicks were fed diets contained three levels of guar meal which were control diet without guar meal, low level of guar meal (2, 4 and 6% in starter, grower and finisher diets, respectively), and intermediate level of guar meal (4, 6 and 8% in starter, grower and finisher diets, respectively). They found that there was significant effect in triglyceride, cholesterol and HDL, highest plasma level of triglyceride, cholesterol and HDL were reported in High guar meal group but there was no significant effect in blood LDL between groups.

Kamran *et al.* (2002) studied the effect of using levels of commercial enzyme with different levels of guar meal in broiler diet on economical utilization of broiler chicks. Treatments were 4 groups of enzyme supplement (A, B, C and D) with and without levels of guar meal (0%, 5, %10 % and 15% guar meal from diets), and found that the cost per Kg live body weight gain for groups A, B, C, D, E, F, G and H was recorded 25.94, 26.82, 28.27, 35.36, 26.16, 27.65, 29.98 and 33.69 respectively.

The aim of the feeding trial was to evaluate the effects of inclusion of guar meal as a partial or total replacement for soybean meal in starter (7-21d.), grower, (22-28d.) and finisher1 (29-35d. diets then all broiler chicks fed on finisher 2 diet (36- 42d.,0.0 %guar meal) on broilers performance ,carcass traits and economical evaluation.

MATERIALS AND METHODS

The present study was carried out at the poultry experimental unit, Agriculture Experiment and Research station at Shalakan, Faculty of Agriculture, Ain shams University. This experiment was conducted to study the effect of using guar meal (GM) as a replacement of soybean meal (SM) in the diets of broiler chickens on growth performance, carcass and bone traits, some blood plasma parameters and economic evaluation. Experimental design and protocol within this study were conducted according to ethical guidelines approved by the Experimental Animal Care and Research Ethics Committee of Ain Shams University, Agriculture Sector Committee (Approval No 5-2023-14).

Guar meal was purchased from Dakahlia Poultry Company and chemical composition of the product as follows: 50% CP, 2.56% Lysine, 2.96% Methionine, and 2520 k cal. ME. A total number of 125 Ross broiler chicks were used in this study. Chicks were randomly distributed into 5 treatments, each containing 25 chicks in 5 replicates of 5 chicks.

Birds were reared under similar managerial conditions and monitored daily for mortality number. Feed and water were provided ad-libtum. Broiler chicks were kept in cages of wire floored batteries under a total 23 hours light/day regimen during the experimental period (7-42) days of age. During the experimental period chicks were fed on five experimental diets were formulated in which (control diet was 100% SM + 0.00 GM) in the other four experimental diets GM were incorporated at levels (87.5% SM+12.5% GM; T1), (75% SM+25%GM; T2), (50% SM+50%GM; T3) and 0.00 SM +100% GM; T4) to obtain starter (7-21 days), grower (22-28 days), finisher1 (29-35 days) diets, then all chicks fed on finisher2 diet with control (100% SM + 0.00 GM) from 36-42 days of age. The experimental diets and their chemical composition are present in Table (1).

Data were collected on live body weight and feed intake at 7, 21, 35 and 42 days of age. Body weight gain and feed conversion ratio (g feed/g gain) were calculated. Mortality rate was also recorded. At the end of experiment period (42 days of age), slaughter tests were performed using three chicks around the average mean of body weight of each treatment to determent some carcass and bone traits. Blood samples were taken from the slaughtered birds and plasma was separated by centrifugation at 3000

Table (1): Composition and calculated analysis of the experimental diets for chicks at 7-42 days of age.

Ingredients	Starter diets (7 to 21 days)					Grower diets (22 to 28 days)					Finisher diets1 (29 to 35 days)					Finisher diets2 (36 to 42 days)
		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	63.51
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	29.10
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	0.00
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	3.90
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	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	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	0.30
Common 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	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	0.14
Calculated analysis** :																
ME(Kcal/Kg diet)	2982	2983	2988	2998	3012	3064	3065	3070	3078	3088	3164	3163	3166	3176	3187	3164
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	19.03
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	166.2
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	0.89
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	0.40
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	0.51
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	1.09

**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.*

*** Calculated analysis of the experimental diets were done according to (NRC, 1994).*

**** con=control (100% SM) T1= 87.5% SM+12.5%GM , T2=75% SM+25%GM, T3=50% SM+50%GM and T4=100% GM*

rpm for 15 minutes and quantitive determination of blood total protein, albumin, triglycerides, cholesterol, GOT and GPT.

The economic efficiency was calculated from the input-output analysis based on the prices figures on the recent prices of local markets for ingredients and selling prices of chickens in Qalibia region.

Statistical analysis of experiments was conducted using the general linear model (GLM) procedure of base SAS® (SAS instituted, 2004). Factors test using one way ANOVA. Means were compared using Duncan´s range test (Duncan, 1955) where the level of significance was set at minimum ($P \leq 0.05$).

Dietary treatments were assigned as the main factor, the statistical model performed as fallow:

$$Yij = \mu + Ti + Eij$$

Where: Yij= is the effect of the observation, μ = overall mean, Ti = the effect of ith dietary treatments, Eij = random error.

RESULTS AND DISCUSION

Effects of dietary treatment on productive performance:

The effect of feeding Guar meal (GM) on productive performance of broiler chicks can be shown as follows:

Live body weight and body weight gain:

The live body weight and body weight gain of broiler as affected by dietary treatments are illustrated in Table (2). It is worth to noted that the chicks fed GM (T1-4) during (7-35) days of age reflected the lowest significant ($P \leq 0.05$) results in both live body weight and body weight gain compare with control group. On the other hand, chicks fed low levels of GM (T1 and T2) gave higher live body weight (155.40 and 1480.4 g) compared to those fed diets containing higher levels of GM (T3 and T4) being 980.0 and 476.0 respectively, the differences were statistically significant. Those results are in agreement with the results of (Conner,2002; Lee *et al.,* 2003, Lee *et al.,* 2005, Turki *et al.,* 2011 and Hussan 2013). The explanation of that could be related to the fact that, control diet was formulated to meet the optimum nutrient requirement for broiler chicks based on the recommendations of NRC (1994).

On the other hand, a possible explanation for this reduction on body weight might be attributed to the presence of anti-nutrient compounds in GM such as guar gum, trypsin inhibitorn saponins, poliphenols and hemaglotnins as some another unknown toxic substances (Lee *et al.,* 2005). During the finishing2 period (36-42) days of age, feeding diets containing GM (T1-4) showed that the highest figures in body weight gain shown by chickens fed (T2) diets followed by those fed (T1) diet, while chickens fed (T3-4) diets had the lowest values. There were significant differences among treatments compared with control group. In addition, (T3) showed the highest reduction in body weight gain compared with the (T2) group (486.00 vs. 651.60). Besides, the differences between the two treatments were significant. Broiler chickens fed diets containing GM during experimental period (7-42) days of age showed the lowest body weight gain except T1 compared with those fed control diets and in most cases differences were significant. In addition, chickens fed (T4) diet gave the lowest body weight compared to those fed diets containing lowest levels of GM T1-3 being (871.0 vs. 2066.2, 2002.8 and 1337.4 g) respectively, the differences between treatments were significant. In the same order, the figures of body weight gain indicated insignificant differences between chickens fed diets containing GM (T1 and T2) compare with control diets during experimental period (7-42) days of age and the corresponding values were 2066.2, 2002.8 and 2195.8 g respectively, however, the differences failed to be significant. The same trend was observed by (Lee *et al.,* 2003, Mohammed *et al.,* 2012 and El-Faham *et al.,* 2017). They concluded that the lowest dietary levels of GM supported chickens growth compares with those fed higher levels.

Feed intake and feed conversion ratio:

The results in Table (2) indicated that feed intake per chicken decreased by feeding low levels of GM (T1-2) compared with those fed control diets. The corresponding figures were (4164.6 vs. 4033.4 and 4097.8 g) respectively, without any significant differences. On the contrary, induction of GM by high levels (T3 and T4) in the broiler diets reflected a significant reduction in the feed intake compared

with control group and feed intake decreased by (23% and 54%) respectively compared with that fed control diets.

The results of feed conversion ratio (FCR) in Table (2) showed that chicken fed control diets (0.0 GM) during starter, grower and finisher diet1 (7-35) days of age or during the whole experimental period (7-42) days of age reflect the best values of feed conversion ratio compared by those fed different levels of GM (T1-4). On the contrary, during finisher diet2 (36-42) days of age FCR for chickens fed control diets showed the worst significant figures compared with that fed different levels of GM (T1-4) this may be due to the fact that unpalatability of the diet and the residual gum content of GM (lee *et al.*, 2005). In addition Turki (2011) reported that GM is sticky in nature and increased intestinal viscosity and decreased digestibility coefficients of all macronutrients resulted decrease digestive enzyme activity throughout the small intestine.

Table (2): Effect of different dietary treatment on productive performance of broiler chickens.

Items	Treatment					Sig
	Con	T1	T2	T3	T4	
Live body weight (g)						
7 days	128.84	129.08	129.24	128.68	129	**NS**
34 days	1735.20^{a}	1559.40^{b}	1480.40^{b}	980.00^{c}	476.00^{d}	**
42 days	2324.60^{a}	2195.00^{ab}	2132.00^{b}	1466.00^{c}	1000.40^{d}	**
weight gain(g)						
7-35 days	1642.3^{a}	1462.00^{b}	1350.64^{b}	851.32^{c}	348.36^{d}	**
36-42 days	589.40^{bc}	635.60^{ab}	651.60^{a}	486.00^{c}	524.40^{bc}	*
7-42 days	2195.80^{a}	2066.20^{a}	2002.80^{a}	1337.40^{b}	871.00^{c}	**
Feed intake						
7-35 days	2964.6^{a}	2878.4^{a}	2897.8^{a}	2115.2^{b}	1367.2^{c}	**
36-42 days	1035.00^{a}	990.00^{a}	1035.00^{a}	871.00^{ab}	705.00^{b}	**
7-42 days	4164.60^{a}	4033.40^{a}	4097.80^{a}	3151.20^{b}	2237.20^{c}	**
Feed conversion						
7-35 days	1.80^{b}	1.97^{b}	2.15^{b}	2.48^{b}	4.14^{a}	**
36-42 days	1.77^{a}	1.57^{c}	1.58^{bc}	1.34^{d}	1.34^{d}	**
7-42 days	1.89^{c}	1.95^{c}	2.05^{c}	2.35^{b}	2.57^{a}	**
Mortality (%)	0/25	0/25	0/25	0/25	0/25	**NS**

*Means within the some row with different superscripts are significantly different. Sig=Significance** (P≤0.01), * (P≤0.05). NS=Non Significance. con= control*
SM= soybean meal GM= guar meal

Mortality rate:

Under the condition of the present study all chickens appeared healthy and the total mortality rate was 00.0% during the total experimental period (42 days), without any clear differences among treatments. These observations were in agreement with results obtained by Khalifa *et al.* (2017) who concluded that no adverse effect were observed on health condition and mortality rate when broiler chicks (Hubbard) were fed various levels of GM (2.5, 5.0, 7.5 and 10%) to replaces SM in the five dietary treatments. Also, Bengmark (1998) demonstrated that galactomannans found in guar beans can reduce colonization of pathogenic gastrointestinal bacteria and improve chicken healthy and immunity.

Carcass characteristics:

Table (3) shows the effect of different dietary treatments on carcass characteristics of broiler chicken slaughtered at the end of experiment (42 days of age). Experimental treatments (T1-4) had no significant effect on studied parameters compared with control except gizzard and giblets percentages. The corresponding values for carcass% ranged between 63.02 and 68.42%, while total edible parts% ranged between 67.57 and 72.19 and broiler chickens fed control diets gave the highest figures while chicken fed T3 diet (50% SM+50% GM) had the lowest figures. Besides, the differences between the two treatments were insignificant on the contrary, gizzard and giblets percentages figures showed significant differences between treatments, in which control group reflected the lowest figures compared with other dietary treatments T1-4 and the corresponding figures being 1.16 and 3.79%, while chickens fed T4 diet (100% GM) gave the highest figures, being 1.79 and 5.23, respectively, and the differences between treatments were significant. Similar observation was reported by other investigators, Muhammad *et al.* (2002), Lee *et al.* (2005), El-Faham *et al.* (2017) and Khalifa *et al.* (2017), they reported that adding GM to broiler diets had no significant effects on carcass treats. The

obtained data are in disagreement with those reported by Kamaran *et al.* (2002) and Mohayayee (2011) who showed that inclusion of GM in broiler chickens rations reflected a negative effect on carcass dressing%.

Table (3): Effect of different dietary treatment on some of carcass characteristic of broiler chickens at 6 weeks of age.

Items	Treatments					Sig
	Con	T1	T2	T3	T4	
Carcass%	68.41	68.07	63.36	63.02	65.01	NS
Liver %	2.22	2.16	2.30	2.68	2.85	NS
Gizzard %	1.16^{c}	1.41^{bc}	1.45^{b}	1.40^{bc}	1.79^{a}	**
Heart %	0.41	0.38	0.47	0.46	0.58	NS
Giblets %	3.79^{b}	3.96^{b}	4.22^{ab}	4.54^{ab}	5.23^{a}	*
Total edible parts	72.19	71.91	67.56	67.57	70.13	NS
Abdominal fat %	1.25	0.80	0.60	0.96	1.34	NS

*Means within the some row with different superscripts are Significantly different. Sig=Significance** (P≤0.01), * (P≤0.05). NS=Non Significance.*

Tibia measurements:

Table (4) shows the effects of dietary treatments on some tibia measurements at the end of 42 days of age. Data of tibia weight, g (wet or dry), tibia length (cm), tibia width (mm), tibia seeder index and tibia breaking strength (kg/cm2) showed significant differences within all groups. The corresponding values for wet tibia weight (g) ranged between 4.79 and 14.44 g, tibia dry weight (g) ranged between 2.55 and 7.30 (g), tibia length (cm) ranged between 7.13 and 9.76 (cm), tibia width (mm) ranged between 0.65 and 0.97, tibia seedor index ranged between 0.36 and 0.75, tibia breaking strength ranged between 20.66 and 33.33 (kg/cm2).

In the same order, the figures of tibia measurements indicted significant differences between chickens fed diets containing high levels of GM (T3-4) compared with those fed control diet or low levels of GM (T1-2). The worst figures of tibia measurements found in birds fed high levels of GM (T3 or T4), which could be due to the high levels of anti- nutrition compounds in GM (Lee *et al.,* 2005). The residual gum due to its stick nature, will increase the passage of ingesta in the intestines, resulting in a lower feed utilization and consequently mineral absorption (Lee *et al.,* 2003).

Table (4): Effect of different dietary treatment on some of bone measurement broiler chickens at 6 weeks of age.

Items	Treatments					Sig
	Con	T1	T2	T3	T4	
Wet Tibia Weight(g)	12.44^{a}	10.68^{a}	11.52^{a}	7.01^{b}	4.79^{c}	**
Dry Tibia Weight (g)	7.30^{a}	6.17^{b}	6.71^{ab}	3.86^{c}	2.55^{d}	**
Tibia length (mm)	9.76^{a}	9.31^{a}	9.28^{a}	8.31^{b}	7.13^{c}	**
Tibia Width (mm)	0.88^{ab}	0.88^{ab}	0.97^{a}	0.68^{b}	0.65^{b}	**
Tibia Breaking Strength(Kg/cm^2)^3	29.00^{ab}	33.33^{a}	27.66^{bc}	24.66^{bc}	20.66^{c}	*
Seedor index	0.75^{a}	0.67^{a}	0.72^{a}	0.47^{b}	0.36^{c}	**

*Means within the some row with different superscripts are significantly different. Sig=Significance** (P≤0.01), * (P≤0.05). NS=Non Significance. con= control*
SM= soybean meal GM= guar meal

Blood plasma parameters:

Table (5) shows the relationship between dietary GM and some blood plasma parameters at 42 days of age. The concentration of plasma total protein, Globulin, Triglycerides, cholesterol for broiler chickens fed 100% GM (T4) reflected significant higher than those fed control diets (100% SM). Also, data showed that chickens fed control diets have recorded significantly higher plasma ALT concentration compared to other groups (T1-4). In addition, the figures of blood plasma parameters except ALT indicated insignificant differences between chickens fed diets containing low level of GM (T1) or intermediate levels (T2-3) compared with those fed control diets (0.0% GM). These results appeared that although body weight and body weight gain decreased by guar meal (T4), but the

concentration of plasma total protein read the highest value than other treatments. It may be guar increase globulin concentration in plasma so total protein increased, that mean guar treatments improved the birds immunity by globulin increment.

Table (5): Some measurements of blood broiler chickens at 6 weeks of age.

Items	Treatments					Sig
	Con	T1	T2	T3	T4	
Total protein	3.85^{b}	3.47^{b}	2.88^{b}	3.10^{b}	4.84^{a}	**
Albumin	1.45	1.37	1.53	1.39	1.40	NS
Globulin	2.19^{b}	2.09^{bc}	1.35^{c}	1.77^{bc}	3.44^{a}	**
Triglycerides	88.24^{b}	66.27^{bc}	61.96^{c}	84.71^{bc}	111.76^{a}	**
Cholesterol	96.33^{c}	107.90^{bc}	130.82^{ab}	92.87^{c}	139.88^{a}	**
GOT	18.28	21.37	15.45	14.78	17.34	NS
GPT	11.07^{a}	2.81^{b}	4.68^{b}	3.56^{b}	3.06^{b}	*

*Means within the some row with different superscripts are significantly different. Sig=Significance** (P≤0.01), * (P≤0.05). NS=Non Significance. con= control;*
SM= soybean meal GM= guar meal

Although, triglycerides, broilers fed T1-3 had the lowest concentration levels than control. The highest one that birds fed (T4). That mean, guar treatments decreased the triglycerides, concentration in plasma and that's good for birds healthy. On the other side, T3 only decreased cholesterol level than control and other treatments. All treatments improved liver function than control and that clean by GPT levels, the lowest GPT concentration in all treatments compared with control.

These results are inagreement with those reported by Mohayayee *et al.* (2011) who found that feeding broiler chicks different levels of guar of plasma cholesterol and triglycerides. These findings are in contrast with results obtained by Yamamoto *et al.* (2000) who concluded that there was no significant effect in plasma portions or cholesterol when used GM in broiler diets up to 12%.

Economic evaluation:

Data presented in Table (6) showed the relative economic efficiency of the broiler chickens fed different dietary treatments (control and T1-4) during experimental period (7-42) day of age. Results showed that, the highest values of price L.E of kg feed, feed intake cost and total cost were recorded for the control treatment. While the lowest values were recorded for (T1-4). Moreover, feeding (GM) by different treatments from T2 till T4 gave the lowest relative economic efficiency being 93.86, 68.28, and 68.64% respectively. On the other hand, the best REE were recorded by control and T1 treatments and the corresponding values were 100.00 and 100.08 respectively.

Table (6): The economic evaluation.

Items*	Treatment				
	Co	T1	T2	T3	T4
live body weight Kg (A)	2.32	2.20	2.13	1.47	1.00
Price of live body weight L.E. /kg (B)	65.00	65.00	65.00	65.00	65.00
Revenue L.E./chick (C)**	151.10	142.68	138.58	95.29	65.03
Sum of feed intake kg (D) / 42 days	4.16	4.03	4.10	3.15	2.24
Price of kg feed / L.E.(E)	21.91	21.24	20.74	19.75	17.83
Feed intake cost L.E. (F)**	91.24	85.68	84.98	62.23	39.89
One day chick cost / L.E. (J)	8.00	8.00	8.00	8.00	8.00
Total cost / L.E. (H)**	99.24	93.68	92.98	70.23	47.89
net revenue L.E. (I)**	51.86	48.99	45.60	25.06	17.13
Economic Efficiency (G)**	52.26	52.30	49.05	35.68	35.77
Relative Economic Efficiency REE (K)**	100.00	100.08	93.86	68.28	68.46

*Means within the some row with different superscripts are significantly different. Sig=Significance** (P≤0.01), * (P≤0.05). NS=Non Significance. con= control*
SM= soybean meal GM= guar meal

CONCLUSION

From the present results, it could be stated that, feeding Ross broiler chicks (GM) at level of T1 (87.50 SM + 12.50% GM) from 7-35 days of age and 100% SM from 36-42 days of age, would have a positive effect on productive performance and economic efficiency without any adverse effect on carcass characteristics, blood parameters.

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تاثير الاستبدال الجزئي أو الكلي لكسب فول الصويا بكسب الجوار على أداء النمو والعائد الاقتصادي لدجاج التسمين

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أجريت تجربة لتحديد تأثير الاستبدال الجزئي أو الكلي لكسب فول الصويا (SM) بواسطة كسب الجوار (GM) في علائق دجاج التسمين (البادئ، النامى، الناهى1) بعمر 7-35 يوماً وتغذية جميع الطيور SM في العليقة الناهى2 (عمر 36-42 يوماً) على الأداء الانتاجى وخصائص الذبيحة والتقييم الاقتصادي لدجاج التسمين.

استخدام في التجربة 125 طائر عمر 7 أيام من سلالة الروس قسمت عشوائيا على 5 معاملات بكل منها 5 مكررات (5 طائر/مكررة). تم استخدام خمسة مستويات من GM تمثل 0.00 (كنترول)، 4.75، 9.50، 19.00 و 38.00% GM خلال فترة البادى، بينما أثناء فترة النامى 0.00 (كنترول)، 4.15، 8.30، 16.60 و 33.20% GM وخلال فترة الناهى 0.00 (كنترول)) ، تم استخدام 3.65، 7.125، 14.25 و 28.50% GM) لتعويض (SM) في المعاملات الخمس (Con. و4-T1) ومن ثم تمت تغذية جميع طيور التسمين على العليقة الناهى2 (36-42 يوم، 100% SM).. كما تم توفير العلف والمياه بصورة حرة. في نهاية التجربة تم اختيار 3 طيور من كل معاملة عشوائيا وذبحها لدراسة قياسات الذبيحة وصفات العظم وبعض قياسات الدم.

سجل وزن الجسم واستهلاك العلف وحسب معدلات النمو ومعامل التحويل الغذائى لبدارى التسمين طوال الفترة التجريبية

تتلخص اهم النتائج فيما يلى:

- وزن الجسم ووزن الجسم المكتسب واستهلاك العلف انخفض مع زيادة نسبة استبدال كسب الصويا بكسب الجوار ولذلك تدهور معامل التحويل الغذائي طوال فترة التجربة (7- 42) يوم
- صفات الذبيحة فيما عدا % للقانصة و%للحوائج لم تتاثر بالمعاملات الغذائية المختلفة.
- صفات العظم وقياسات تركيب بلازما الدم فيما عدا تركيب الالبيومين و GOT تاثرت معنويا بالمعاملات الغذائية المختلفة
- سعر كجم علف وتكاليف التغذية تنخفض بزيادة كسب الجوار فى علائق دجاج اللحم بينما العائد الاقتصادى النسبي ينخفض.
- الكتاكيت المغذاه على 87.5% كسب صويا+ 12.5%كسب جوار (T1) ثم 100% كسب صويا اعطت افضل النتائج لوزن الجسم والوزن المكتسب واستهلاك العلف ومعامل التحويل الغذائى والعائد الاقتصادى النسبي بدون تاثيرات سيئة على صفات الذبيحة والعظم وتركيب بلازما الدم

الخلاصة

يمكن استخدام كسب الجوار بديلا عن كسب فول الصويا فى علائق بدارى التسمين بمعدل 87.5% كسب صويا+ 12.5%كسب جوار من 7 الى 35 يوم ثم 100% كسب صويا حتى 42 يوم للحصول على افضل اداء انتاجى وصفات ذبيحة وعائد اقتصادى.