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Research Article

The Potential Influence of Fractional Substitute of Soybean Meal with Guar Meal Supplement of Salinomycine and Mycofixe on Performance and GUT Ecosystem of Broiler

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ABSTRACT
Target of this study to appraise affect of adding up gaur meal 10% as partial replacements of soybean meal with or without salinomycine 500 gm/ton and mycofix 2kg / ton to the diet of Ross broiler chicken on Live weight, Dressed weight and internal organ weight, gut ecosystem and blood picture at42 days. The experiment was conducted on 150 birds in one day divided to five groups, each groups include 30 birds with two replicate (15 birds) in each replicate, fed on diet contain : Ross: T1 control (1-42 day), T2 Guar meal 10% (1-42 day), T3- Salinomycin 500g\ton (1-42 day), T4- Salinomycin 500g\ton & gaur meal 10% (1-42 day) and T5- Salinomysine 500g\ ton & mycofix 2kg\ton & gaur meal 10% (1-42). Results demonstrated that 2nd group recorded maximum significant ($p \leq 0.05$) differences in Live weight(LW), Dressed weight and internal organ weight also register significant ($p \leq 0.05$) differences in PCV value and Lymphocyte percentage compared with other treatments(T3,T4,T5). There were significant ($p \leq 0.05$) decrement in *Total bacterial count* inT2 then followed by T1compared with other studied groups. In *Lactobacillus count* T2 recorded increments significant ($p \leq 0.05$) differences. The addition of salinomycine at 500gm / ton and maycofix® at 2 Kg /ton to Ross broiler diet has an adverse effect on Live weight, Dressed weight and internal organ weight, gut ecosystem and blood picture at 42 days while supplementing guar meal at level 10% as partial replacements of soy bean meal has shown positive effects on all parameters of studied.

Keywords: Guar Meal, Mycofix, Salinomycin, Blood Picture, Gut, Broiler.

INTRODUCTION

The intensive modern production of poultry has made tremendous win in the effective as well as economic output of superior grad of both meat and egg production as safety characteristic and organic poultry products. At the same time as gains in production and efficiency were achieved, the industry had to increase the life and well-being of birds and reduce the action of the industrialization and manufacturing on the ambience. The make use of dietary inclusion consider as an moral fraction of getting this success. Feed additives are a chief products composed for complete animal feeding to reach to the purpose for improving the quality of feed and quality of food for the human that originated from animal or to improve superior characteristic for animal health. Antimicrobial, antioxidant, minerals, pre and pro biotics considers are the best feed additives used in poultry nourishement also anti myotoxicosis such as mycofixe, enzymes, pH control agents and phytogenic (Hashmi and Davidi, 2010). Some of these supplements are suggested for chemotherapy and prophylaxis while others are known for promoting growth. Salinomycin is a polyether ionophoric abundantly utilize as a feed additive to overpower some of disease infected poultry like coccidiosis. (Bolder *et al*.,1999). Poultry contamination with fungal toxins it is consider as majorissue relationship with nourishment of poultry. Mycotoxins are poisonous metabolites that are produced by genus of fungi that grow naturally on the feed of animals, feed constituent and other agrarainharvest (Mohanamba, 2007; Manafi et al., 2011).Mycofix® has been efficiently used for poultry to reduce the risk of ochratoxicosis and aflatoxin because of its double action, a method of adsorbing mycotoxins with appropriate polarity functional groups such as aflatoxin by an eclectic mix of minerals (Garcia et al., 2003, Zahir, 2005). Usually used antibiotics or other growth enhancers cause disagreeable side effects for instance severe hepatic toxicity with certain drugs,

such as anticoccidialneomycin and antibacterial gentamicin, the reason of sudden death in fowl (Hashmi and Davidi, 2010).At present, researchers are examine the alternative and leastorigin of feed to increase the value of basic nutrients ingredients allowable for feed manufacture (Annongu et al., 2010). Guar wart is as well vigor of the most moral plant used for medical purpose that are prosper chiefly in the subcontinent of Indian. A high concentrations of galactomannan were achieved by growing -up of the crop on a commercial scale. Guar has a highly strong antisecretory effect, anti-ulcer, hypo lipidemia hypoglycemia,, anti-hyperglycemia and its cellular protective (Mukhtar et al., 2008, Al-Obidi&AL-Zuhairi,2019).

Hassan et al. (2010) mentioned meal of guaras byproduct resulting from bean of guarguar throughout the galactomannan (guar gum) extraction which including saponin. Researcher refer that these contents of saponins have antibacterial effects(Hassan et al., 2007), and also used for antiprotozoal (Mshvildadze et al., 2000) while (Gutierrez et al., 2007; Dinani et al., 2010)conclusion for improving used their nutritional ingredients in poultry feed. Some researcher generate comparison between SBM and GM conclusion to GM contains 88% of the unprocessed protein found as a real protein. GM have high content of its arginine, As it is known that arginine have an important role in cell physiology and metabolism activity in birds. The meal of soybean conceder as main source of protein for poultry feeding, but its applicator for both layer and broiler formulation diet is abundant as a result of shortages and elevated cost. Thus, dietitians commonly try to find viable and not expensive alternative protein components to substitute SBM. Continued using of salinomycin and mycofex cancause disturbing of the physiological activities of the liver and kidneys (Kamashi *et al.*, 2004). Therefore, the experimental was designed to examine the neutralizing effect of meal of guar mixed with or without salonomycin and mycofix on body health performance, blood parameters as well as gut ecosystem in chicken

MATERIALS AND METHOD

The experiments conducted in the Agricultural ministry\ circle Agricultural Research / Baghdad (poultry farm). The experiment was accomplished on 150 birds beginning with the first day of life from Ross broiler from(1-42)days. On arrival, chicks were measured their weights and at random distributed into wood shavings covered floor pen then separated into five experimental sub groups 30 chicks in each. Each subgroup composed of two replicate pens with 15 chicks. The experiment was entirely design randomly and nourishment groups were conducted as follows.

Table 1: Nourishments groups

Groups (n=30)	Treatments
T1(Control)	Ordinary feed
T2	Ordinary feed with Guar meal 10%
T3	Ordinary feed with Salinomycin 500g/ ton
T4	Ordinary feed with Salinomycin 500g/ton& gaur meal 10%
T5	Salinomysine 500g/ ton & mycofix 2kg/ton & gaur meal 10%

Table 2: Analysis of both meal (G,S)

Element	Guar meal powder specification	Soybean meal (48%) specification
Proteins	51%	46%
Oils	4%	5%
Fibers	12%	5%
Ash	5%	2%
Moisture	10%	12%
Metabolizable energy	2033 (Kcl\Kg)	2550 (Kcl \Kg)
Analysis of Amino acid		
Lysine	2.56 %	3.22%
Arginine	9.96 %	3.6 %
Phenylalanine	3.47 %	2.5 %
Aspartic acid	4.55 %	5.6%
Proline	13.01%	2.11%
Tyrosine	6.3 %	1.76 %

Methionine	2.96 %	0.72 %
Glycine	5.85%	1.9 %
Histidine	3.75 %	1.3%
Leucine	2.40%	3.7%
Valine	2.54%	2.5 %
Glutamic acid	9.24 %	8.28%
Alanine	1.60 %	1.94 %
Tryptophan	0.52 %	0.71 %

Note: The compositions were estimated by Diode Array 7200 NIR Analysis System (kadhim, 2015).

Table 3: Diets used in the experiment (starter, grower, finisher)

Ingredient (%)	Starter (0 -11)day of age		Grower(12-24)day of age		Finisher(23-42)day of age	
	GM(0)	GM(10%)	GM(0)	GM(10)	GM (0)	GM (10%)
corn	49.09	49.07	47.29	51.5	46.22	55
Soybean meal	35	24	31	21	27	17
wheat	10	10	15.5	11	20	11
oil	2	2.8	2.6	3	3.2	3.5
Premixes	2.5*	2.5*	2.5**	2.5**	2.5**	2.5**
Di calicium	0.5	0.6	0.4	0.4	0.3	0.4
limmestone	0.8	0.8	0.6	0.6	0.6	0.6
methionine	0.11	0.11	0.11	-	0.18	-
lysine	-	0.12	-	-	-	-
salt	-	-	--	-	--	-
Guar meal	-	10	-	10	-	10
Total weigt (kg)	100	100	100	100	100	100

Table 4: Chemicals analysis of all type of diets

Ingredient %	Starter (0 -11)day of age		Grower(12-24)day of age		Finisher(23-42)day of age	
	GM(0)	GM(10%)	GM(0)	GM(10)	GM (0)	GM (10%)
Total crude protein (%)	22.1	22	20.7	20.9	19.3	19.4
Fiber (%)	2.74	3.52	2.71	3.48	2. 67	3.4
Fat (%)	4.65	5.55	5.09	5.84	5.73	6.4
Methionine + cyctine	1.03	1.21	0.99	1.08	1.02	1.03
caicium	1.03	1.13	0.89	0.98	0.85	0.16
phosphors	0.48	0.48	0.49	0.47	0.49	0.46
methionine	0.66	0.88	0.64	0.76	0.68	0.74
cyctine	0.37	0.33	0.35	0.32	0.33	0.29
lysine	1.40	1.34	1.29	1.26	1.19	1.14
Total metabolizable energy (kcal / kg)	3029	3035	3096	3092	3157	3157

VACCINATION PROGRAM

All vaccines were leaved and mixed in water free of chlorine (boiling of water then let to cool for one day before using for vaccination). Water and food were stopped and banned from birds for four hours before vaccination. Vitamin C was used at a rate of 1 g / l after each vaccine for each vaccinated chicks.

Table 5: Protective program for broiler

Age of chicks (by days)	Types of the vaccines	Routs of administration
1	Newcastle (single oil)	Injections in back of neck
7	Newcastle (lasota)	Drinking water
14	Infectious bursar disease	Drinking water
17	Newcastle (lasota)	Drinking water
27	Newcastle (lasota)	Drinking water

Blood collection and traits of carcass s: In the end of study at 42 days selected 6 bird from different research groups, weighted to verify total live body weight then slaughtered, feathers were removed, eviscerated and washed with tap water. The dressing weight determined after removing the internal organs then weight: fat, heart, intestine, gizzard, spleen, and liver. Sample of blood samples was gotten from vein of wing then immediately liquated with 2 mL sterilized anticoagulant vials.

Collection and preparation of samples: Enumeration of bacteria

At the age of 42 days, from different research groups, 6 birds were chosen at randomand slaughtered by decapitation. The GUT tract was dissected immediately and 1 g of the internal formula of the duodenum were gathered in the falcon have 10 ml of physiological saline solution with glycerin (9 saline portions and 1 part glycerin) and saved on frosty until grafting and microbiological examination. By using dilution of 1:10, all samples were diluted by a normal saline (Hashmi *et al*., 2012).

Estimation *count of total bacterial*:

The medium of the agar for counting was prepared by suspending of 23.5 g per 1 liter of distilled water. Then the suspension is boiling for complete dissolving, and the agar medium was autoclaved at 121 ° C for 15 minutes to be sterile. Then it was then left to cool to about 55 ° C. The agricultural mediumrun into the petridishes then incubated overnight to make sure the plates were sterility. Next, each plates filled with (100µL) of the diluted sample then spread over agar plate surface by sterile swap. Inoculated plates were re-incubated for 24 hours at 37 ° C typically as standard technique. The colony counter used to calculate the colony.

Estimation Number of *lactobacilli*:

(Merck, Darmstadt, Germany, 2013) advised used MRS agar to calculate *Lactobacillus*. Dishes of plantation were incubated at 37 ° C for 48-72 hours (Engberg *et al*., 2000). The harvest was articulated like a record of colony forming units (CFU) per gram of duodenal contents (Hashemi *et al*., 2012)

Statistical Analysis

All data was obtained from current study analyzed by ANOVA variation analysis. Dissimilarity among groups at the level of 5% as Less significant difference (LSD) was applied (Snedecor and Coehran, 1980).

Results

The result in T6 shown significant differences($p \leq 0.05$) through groups in the end of try.T2 recorded more differences($p \leq 0.05$)significantly compared with other nourished treatments in(LW,DW and internal organs weight),in live weight recorded(2660±40.16) then followed by T1,T3,T4 and T5,in DW recorded (1964.0±47.39) then followed by T1,T3,T4and T5 respectively, in(heart, liver, gizzard, fat, spleen and intestine) recorded(12.63±0.31, 57.83± 1.61, 36.80 ± 2.00, 60.80 ± 1.34,3.500 ±0.18, 139.13 ± 2.62) respectively.

Table 6: Effectiveness of varies types of diets on Live weight, Dressed weight and internal organ (gm) of Ross broiler (means ± SE),n=30

Treatments	Live weight	Dressed weight	Heart	Liver	Gizzard	Fat	Spleen	Intestine
T1	2346.6± 37.36B	1732.0± 10.6B	13.73±0.60 A	51.06±0.34 B	32.86 ± 1.38C	4423 ± 3.96B	2.60 ± 0.13 B	100.83 ± 4.25B C
T2	2660±40.16A	1964.0±47.39 A	12.63±0.31 AB	57.83± 1.61A	36.80 ± 2.00A	60.80 ± 1.34A	3.500 ±0.18 A	139.13 ± 2.62 A
T3	2068.0±27.97 C	1478.0±23.50 C	11.76±0.97 B	39.03±0.89 C	30.60±1.03B C	27.26 ± 0.51C	1.93 ± 0.31 D	102.93 ±3.06 B
T4	2007.3±74.89 C	1342.0±8.42 D	10.33±0.24 B	41.4±4.02 C	27.93± 2.15B	25.96 ±1.73C	2.100 ±0.36 D	109.06 ±10.44 B
T5	1874.66±12.86D	1416.6±39.35 C	12.43±0.65 AB	37.70±0.97 C	37.166 ± 2.90A	31.86±5.43 C	2.33 ±0.42 C	88.33 ±3.94 C

Different capital letters (A, B, C) demonsetereted significant (p≤ 0.05) differences among groups

Table 7: Effectiveness of varies of diets on Blood sample of Ross broiler (means ± SE), n=30

Treatments	RBC	WBC	PCV	Hb	H	L
T1	17.33±0.100	2.91±0.300	35.66±2.96AB	13.33±1.66	8.81±0.42	29.00±1.00AB
T2	20.00±0.11	2.83±0.44	36.33±2.33A	14.00±2.08	9.86±0.76	30.66±2.33A
T3	20.00±0.11	3.166±0.33	32.33±1.45AB	13.33±1.66	8.433±0.59	27.33±1.45AB
T4	17.330±0.20	3.00±0.50	30.00±0.00B	12.33±1.45	8.66±0.54	26.00±0.57B
T5	17.33±0.100	3.33±0.166	32.33±1.45AB	12.66±1.20	9.60±0.00	30.00±0.00AB

Different capital letters (A, B, C) demonseterated significant (p≤ 0.05) differences among groups

Effect of different types of diets on Blood sample of Ross broiler are recorded in table 7.The result shown significant differences (P≤0.05) among all nourished treatments.T2 recorded increment of significant differences in PCV value which recorded (36.33±2.33) then followed by T1(35.66±2.96), also T2 recorded best value in lymphocyte percentage (30.66±2.33) then followed by T5,T1,T3 and T4.There were non significant differences (P>0.05)in RBC, WBC, Hb and H among all treatments in the end of studied.

Table 8: Effect adding different types of diets on evaluation count of both total bacterial and lactobacilli (Cfu/mL) in Ross broiler, (Mean±SE),n=30

Treatment	Total bacterial count X 10^6	Lactobacilli X 10^4
T1	8.4±3.6B	5.6±4.2B
T2	1.92±1.4B	16±12A
T3	126±54A	9.8±4.2B
T4	2.8±1.2B	0.4±0.3800B
T5	84±36AB	0.4±0.3B

Different capital letters (A, B, C) demonseterated significant (p≤ 0.05) differences among groups
The results in table 9 showed significant ($P \leq 0.05$) differences within groups in the final of experiment. The count of total *bacterial* was elevated as we shown in T3 then followed by T5(126±54, 84±36) respectively.T2 recorded lowest value then followed by T1.In *Lactobacill count*,T2recordedsignificantimprovementsamong all treatment (16±12.00) then followed by T3,T1,T4,T5 respectively.

DISCUSSION

In this study, 500 g / ton of salinomycin, 2 kg / ton of mycofixe, the suggested dose, with or without 10% of GM, has a bad consequence on Live and dressed weight as well as internal organ (gm) and blood parameters of Ross broiler, in T3, T4, T5. This finding suggests that persist a plicate of salinomycin, until at the permissible dose, for the prevention of disease caused by the *EmiriaSpp* can inhibit forward of growth, body performance and this congruence with the findings of many workers (Thompson *et al*., 2005).In contrast, Pearson *et al*. (1990) recorded salinomycin has no affect on body weight in broilers at dose of 40-80 ppm. Toxic effect at a elevated dietary level possibly associates to oxidative damage or to turbulence of ions metabolism enclose the internal tissues of the animals host. Furthermore constant purpose of salinomycin may cause disturbance for many process in the body as physiological process of renalas well liver. (Kamashi *et al*., 2004).
Salinomycin chooseeasier rout to alternate of sodium and potassium through cell membrane. Consequently of this unbound movement, the concentricity of ion are altered among the cell membrane and the physiological process of coccidiosis was distressed (Brander et al., 1993). The prophylactic dose of salinomycin may inhibit the the vitals process of the body like physiological process, will lead to energetic of proteolytic enzymes, can be causes bad affect on the integrity of the intracellular and cell membrane and ending to the adverse pathological variation.T2 recorded the highest rate in: Dressed weight, live weight,, internal organs (g) as well as hematological parameters of Ross broiler at the ending of the study, this possibly because of GM having a biological composite that affects body performance. Hassan *et al.* (2010) give a definition to meal of guar as a secondary output comes from bean of guar throughout the extraction of galactomannan from guar gum that contain saponin. These saponin compouned has been examined for antibacterials action (Hassan et al., 2007) and anti-parasitic

impact particulary protozoa (Mshvildadze et al., 2000) also can be applicated as a nourish constituent in chicken nourishments (Gutierrez *et al*., 2007; Dinani *et al*., 2010).

As well as the results in the end of study showed that substituted SBM with GM in fattening nutriment at different stages of growth at 3-18% levels can lead to improve growth performance, while at levels below 3-9% it can lead to improve carcass parameters (Gheisari *et al*., 2011).Latest study conducted maximum content level at 50 g/kg of burgeon guar than roasted of meal of guar bean that indicated it was helpful for growth in broiler nurish (Madzimure et al.,2017). Janampet *et al*. (2016) find that the level of 50% meal of guar which included with the diet as an alternative of groundnut cake could enhance the rate of growth stage and characteristic of nutrients digestion minus causing any undesirable symptoms on body feather efficiency. The results was we shown in table 9 concluded highly differences ($P \leq 0.05$) significantly among groups in the latest of study. The *total bacterial count* was elevated in the T3 then followed by T5(126±54, 84±36) respectively.T2 recorded lowest value followed by T1.In *Lactobacill count*,T2recordedsignificant improvements among all treatment (16±12.00) then followed by T3,T1,T4,T5 respectively. This result may be due to GM contains 5-13% saponin and13-18% residual galactomannan(Van Nevel *et al*., 2005) can be enforce as natural antibacterial assembly. Inclusion percentage of guar meal at 2.5%, 1% of guar gum and 0.125% extraction of guar meal rich of saponin to the feed to chicks for 21 days of age was shown that meal of guar shorten sharpness of *Eimeria tenella* infection and guar which rich extract of of saponin compounedact as antimicrobial action versus many popular pathogens infected poultry like *Staphylococcus aureus* (Huys *et al*., 2005), *E coli* (Turtura *et al*., 1990), *Sal Typhimurium* (Foley et al., 2007), *Clos perfringens* (Van Immerseel *et al*., 2004) as well as *E tenella* (Williams, 2005) than controls. Ehsan as well Torki, 2010 shown when added β-Mannanase to the diet of poultry as supplements containing of guarcan be improved beneficial action like decreased the viscosity property of intestinal digesta, perfect health performance, amelioration of FCR, optimum gut health and immune status(Mehri *et al*., 2010).

CONCLUSION

The meal of guar plant can be a useful ingredient to nourishment of poultry due to its large content of protein and well percentage of amino acid that which may be help for improving the performance of poultry growth. Diets containing 10% GM has shown benefits to improve balance of gut ecosystem. Moreover it was concluded that salinomycin 500 gm/ton and mycofex 2kg/ton at the recommended dose adversely affect the growth performance and gut ecosystem. Therefore, these additives used should be replaced by other practice like natural ingredient or vaccine.

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