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Original article

Effect of use cumulative levels of sesame (sesamum indicum-l) meal with phytase enzyme on performance of broiler chicks

Y. Rahimian[a,*], S.N. Tabatabaie[a], S.M.R. Valiollahi[b], M. Toghiani[a], F. Kheiri[b], F. Zamani[b], A. Rafiee[b], Y. Miri[c], F. Asgarian[b], Y. Khajeali[b]

[a]*Departemant of Animal Science, Islamic Azad University, Khorasgan branch, Isfahan, Iran.*
[b]*Departemant of Animal Science, Islamic Azad University, Shahrekord branch, Shahrekord, Iran.*
[c]*Agricultural Jahad Institutes of Technical and Vocational Higher Education, Isfahan Education Center, Isfahan, Iran.*

*Corresponding author; Department of Animal Science, Islamic Azad University, Khorasgan branch, Isfahan, Iran.

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ABSTRACT

For investigate the effect of feeding the levels of Sesame meal (SSM) for Soybean meal (SBM) with the phytase enzyme (Phy) on performance of broiler chickens, total 384 one days old broilers chickens (Ross 308) at completely randomized factorial design with 4 treatments of use sesame meal in 2 level of using phytase enzyme with 4 replicates were used. At the end of the trial 2 birds from each pen was slaughtered Carcass weight, dressing, abdominal fat, and intestine weight were also measured. To evaluate the digestibility of phosphorus (P.DI) 0.3 % Dichromium trioxide Marker Cr2o3 was used. Data showed that use of SSM lead to increase broilers feed intake FI ($P<0.05$). Interaction effects between SSM×Phy caused higher FI significantly ($P<0.05$). Use of sesame meal and addition enzyme had no significant effect on FCR significantly. Data from this study showed that levels of Calcium and Phosphorus in blood and Tibia ash were increased were SSM and Phy enzyme used ($P<0.05$). Antibody titer against New Castle Vaccine was not changed. Evaluation of Phosphorous digestibility showed that using SSM with Phy enzyme can increase PDI significantly ($p<0.05$). As result was relevant small intestine mucosa and sub mucosa diameters were significantly increased when we used T1, T2, T3 ($p<0.05$). Musclaris and serosa diameter were higher in T2, T3 than others. Data from

this study showed use of SSM in broilers diets is likely to increase total diameter of small intestine parts ($p<0.05$).

Abbreviations

FI: Feed intake
BW: Body weight
FCR: Feed conversion ratio
Phy: Phytase enzyme
P.DI: Phosphorous digestibility
SBM: Soybean meal

1. Introduction

The insufficient production of soybean meal (SBM) in Iran has lead to permission being granted for an import of this product form other countries such as Brazil, China and Argentina. However today the price is considerably still high due to government policy which also on the other hand has to encourage soybean growers in the country. Search for alternative vegetable protein sources, which are cheap and locally available, has become an urgent subject to poultry nutritionists in Iran. In addition one of the methods for increase in productive of broilers is appending medical plants to poultry diets as nutritional and medical sources (Darrell J. Bosch, et al, 1997; Deyab, D. M et al ,2009). Sesame (Sesamum indicum L) seed is a drought, tolerant crop adapted to many soil types (1, 2). Full fat sesame seed and the meal after oil extraction are not only excellent sources of edible nutrients (45 to 50% lipid, 15 to 20% protein, and 10 to 15% carbohydrate and 47.1% to 52.9% crude protein, respectively (Al Harthi, M. A., 2009; Deyab, D. M et al 2009). The amino acid composition of the protein is similar to that of soybean meal with the exception of lower lysine and higher methionine in sesame .The fiber content of the seed ranges from 2.7 to 6.7% (36).The high amount of calcium (CA) and Phosphorus (P) are also less available due to its high phytic acid content. Some studies that showed phytic acid could be eliminated when the meal was heated under 15 Psi for 4 hours (Kies, A.K.2001, Lease, J.G, 1996). Phytase enzyme (Phy) utilization as an additive Supplementation in poultry diets has extensive due to public concern surrounding phosphorus pollution, and its ability to increase non phytate phosphorus (NPP) utilization. Phytic acid also reduces the activity of pepsin, trypsin, and α-amylase (Hirose.N,1991; Kanekol.K,2002; Sing.M et al,1982).Phytase enzyme supplementation has been shown to reduce phosphorus and nitrogen excretion and it can use full for increase digestibility an availability of phytate bound some mineral such as phosphorus, calcium, copper and zinc (Gordon.R.W,1998; John.G,1196).Phytase as an enzyme is capable of breaking down phytates in feeds to release inorganic phosphorus and inositol as well as protein, amino acids, trace minerals and other nutrients chelated with phytase. Thus, phytase can reduce or eliminate the supplementation of inorganic phosphorus in feeds for monogastric animals and improve the utilization efficiency of these nutrients contained in feedstuff. As much as 90 % of the total phosphorus in cereals and oilseeds can be locked up in the form of phytate, which is a virtually indigestible form of phosphorus in plants used in animal feeds (Lease, J.G, 1966; Namkung,H. .1997).The enzyme phytase is a novel and cost effective tool in poultry diets that improves phosphorus utilization from phytin, the storage form of phosphorus in feedstuffs. As phosphorus retention is still far below a hypothetical maximum of 100% considerable room for improvement in phytin-phosphorus release and overall phosphorus retention by poultry and swine still exists(YoungL.G.,1993; Yung-Shin.S.H.,2002). Many studies that showed SSM could be used instead of SBM at 15-25 % in broilers diet and the higher levels of use SSM caused higher fat deposition and lower protein content of the broilers carcass (Sebastian.S., et al, 1998; Yamashita.K et al, 1995; Yamashita.K.et al, 2006).The important of SSM use for broilers seems to become more popular as poultry feed due to its low price (Agbulu, O.,2010; Al Harthi,2009). As mentioned above it has become clear that there is a quite bite of benefits of sesame meal as good source of protein and a medical and nutritional resource to be used for poultry. Therefore, the objective of this study is to investigate the effect of feeding cumulative levels of SSM as a replacement for SBM with the supplementation of phytase (Phy) on performance, blood constituents and carcass traits and intestinal morphology of broiler chickens.

2. Materials and methods

For determine the effect of use cumulative levels of sesame meal with phytase enzyme on performance of broiler chickens a total 384 one day broilers chicks (Ross 308) were used at completely randomized factorial design with 4 treatments of use sesame meal in 2 level of using phytase enzyme with 4 replicates for each of them. The experiment was carried out in 49 days. Each treatments group was fed on a starter diets. Sesame meal purchased from local market and dried and then grounded separately to a fine powder and then mixed with the basal diet (Tables 2) Feed and fresh water were provide ad libitum during this experiment. Sesame meal sample was analyzed in the lab for determine amount of ME, Crude protein, Calcium, Phosphorus and Its Crude fiber with (AOAC, 1994) method (Table 1)

Table 1
Chemical Composition and proximate analysis of the tested diets.

Compounds	ME (Kcal/Kgr)	CP (%)	Met+Cys (%)	Lys (%)	Ca (%)	A.P (%)
Sesame meal	2210	41	1.94	0.90	0.91	0.52
Soybean meal	2230	42	1.28	2.69	0.29	0.27
Corn grain	3350	8.33	0.36	0.26	0.02	0.08
DCP	--	--	--	--	22	16
Vegetable Oil	9400	--	--	--	--	--

Treatments were Control (contain control group, basal diet with no substation SSM for SBM), T1 (basal diet with 5% SSM), T2 (basal diet with 10% added SSM), T3 (basal diet with 15% added SSM) for 0-21 days (first diet) and Control diet , T1 (basal diet with 10% SSM), T2 (basal diet with 15% added SSM), T3 (basal diet with 20% added SSM) for 21- 42 days (Grower diet) and Control diet , T1 (basal diet with 15% SSM), T2 (basal diet with 25% added SSM), T3 (basal diet with 30% added SSM) for 42-49 days (finisher diet) with or with out phytase enzyme E0 and E1 (500 FTU/ Kg of Nataphous 5000) that they were balanced according to their requirement as shown in (NRC for poultry ,1994)

Table 2.1
Calculated composition and nutrients contents of experimental diets (0-21) days.

Ingredients %	Control	T1 (5% SSM)	T2(10% SSM)	T3(15 % SSM)
Corn grain	54.71	55.48	55.23	55.20
Soybean meal	39.02	33.77	28.95	24.15
Sesame meal	0	5	10	15
Vegetable Oil	2.1	1.8	2	2
DCP	1.68	1.56	1.49	1.41
Oyster shells	1.5	1.45	1.42	1.36
Methionine D-L	0.14	0.09	0.06	0.03
Nacl	0.25	0.25	0.25	0.25
Vitamin Premix*	0.30	0.30	0.30	0.30
Mineral premix*	0.30	0.30	0.30	0.30
Calculated nutrient content ME(Kcal/Kgr)	2900	2900	2900	2900
CP (%)	20.84	20.84	20.84	20.84
Ca (%)	0.90	0.90	0.90	0.90
Available Phosphorus (%)	0.41	0.41	0.41	0.41
Lysine (%)	1.17	1.17	1.17	1.17
Methionine+Cystine (%)	0.81	0.81	0.81	0.81

*Supplied Per Kilogram Of Feed, 7.500 IU of vitamin A, 2000IU vitamin D3, 30 Mg vitamin E,1.5 µg vitamin B12,2Mg B6,5Mg Vitamin K,5 Mg vitamin B2,1 Mg vitamin B1,40 Mg nicotinic acide,160µg vitamin Biothine,12 Mg Calcium,pantothenate,1Mg,Folicacide 20 Mg Fe,71 Mg Mn,100µg Se,37Mg Zn,6 Mg Cu,1.14 Mg I,400 µg Cu.

Table 2.2
Calculated composition and nutrients contents of experimental diets (21-42) days.

Ingredients %	Control	T1 (10% SSM)	T2(15% SSM)	T3(20 % SSM)
Corn grain	60.98	62.32	62.30	61.21
Soybean meal	32.81	22.42	17.60	13.23
Sesame meal	0	10	15	20
Vegetable Oil	2.4	1.9	1.95	2.35
DCP	1.25	1.02	0.96	0.89
Oyster shells	1.67	1.50	1.40	1.47
Methionine D-L	0.04	0	0	0
Nacl	0.25	0.25	0.25	0.25
Vitamin Premix*	0.30	0.30	0.30	0.30
Mineral premix*	0.30	0.30	0.30	0.30
Calculated nutrient content ME(Kcal/Kgr)	3000	3000	3000	3000
CP (%)	18.75	18.75	18.75	18.75
Ca (%)	0.84	0.84	0.84	0.84
Available Phosphorus (%)	0.33	0.33	0.33	0.33
Lysine (%)	1.03	1.03	1.03	1.03
Methionine+Cystine (%)	0.67	0.67	0.67	0.67

*Supplied Per Kilogram Of Feed, 7.500 IU of vitamin A, 2000IU vitamin D3, 30 Mg vitamin E,1.5 µg vitamin B12,2Mg B6,5Mg Vitamin K,5 Mg vitamin B2,1 Mg vitamin B1,40 Mg nicotinic acide,160µg vitamin Biothine,12 Mg Calcium,pantothenate,1Mg,Folicacide 20 Mg Fe,71 Mg Mn,100µg Se,37Mg Zn,6 Mg Cu,1.14 Mg I,400 µg Cu.

Table 2.3
Calculated composition and nutrients contents of experimental diets (42-49) days.

Ingredients %	Control	T1 (15% SSM)	T2(20% SSM)	T3(25 % SSM)
Corn grain	64.27	64.50	64.40	64.40
Soybean meal	29.02	14.26	9.40	4.50
Sesame meal	0	15	20	25
Vegetable Oil	3.2	3.15	3.20	3.20
DCP	1.06	0.77	0.68	0.65
Oyster shells	1.60	1.47	1.43	1.40
Methionine D-L	0	0	0	0
Nacl	0.25	0.25	0.25	0.25
Vitamin Premix*	0.30	0.30	0.30	0.30
Mineral premix*	0.30	0.30	0.30	0.30
Calculated nutrient content ME(Kcal/Kgr)	3100	3100	3100	3100
CP (%)	17.43	17.43	17.43	17.43
Ca (%)	0.77	0.77	0.77	0.77
Available Phosphorus (%)	0.29	0.29	0.29	0.29
Lysine (%)	0.94	0.94	0.94	0.94
Methionine+Cystine (%)	0.58	0.58	0.58	0.58

*Supplied Per Kilogram Of Feed, 7.500 IU of vitamin A, 2000IU vitamin D3, 30 Mg vitamin E,1.5 µg vitamin B12,2Mg B6,5Mg Vitamin K,5 Mg vitamin B2,1 Mg vitamin B1,40 Mg nicotinic acide,160µg vitamin Biothine,12 Mg Calcium,pantothenate,1Mg,Folicacide 20 Mg Fe,71 Mg Mn,100µg Se,37Mg Zn,6 Mg Cu,1.14 Mg I,400 µg Cu.

Body weight, body weight gain, feed consumption, and feed conversion ratio were weekly calculated. At the end of the experiment, estimated slaughter yield were also carried out by randomly using two broilers around the average body weight from each treatment group. Selected chickens were deprived from feed for 12 hours, weighed and were slaughtered to complete bleeding (totally 64 bird), followed by plucking feathers then weighted. Carcass weight, dressing, abdominal fat, and intestine weight were recorded and intestine length was also measured. Blood samples from each bird were collected for determine their triglyceride, calcium and phosphorus in blood samples and tibia ashes were measured (Gordon.R.W, 1998). Some blood samples were analyzed for their antibody titers against New Castle Vaccine by Haemagglutination inhibition test (HI).Finally samples from small intestine tissue to determination intestinal morphology were collected. To measurement the digestibility of phosphorus 0.3 % Dichromium trioxide Cr2o3 Marker (Merk Germany) was used, and then digesta content from Meckel's diverticulum due to ileum terminal was Sampled and PDI calculated from fallowing formula (Fenton,TW., and M.Fenton,1979),

Phosphorus Digestibility %, (Phosphorus diet / Phosphorus fecal × Cr2o3 diet / Cr2o5 fecal - 100) × 100

In the last data were collected and analyzed by using the General, Linear model procedure of (SAS User's Guide ,1992) different means Duncan's multiple ranges test was used to detect the differences at level ($p<0.05$).

The statically model was,

$Xijk = \mu + \acute{\alpha} i + ßj + (\acute{\alpha} + ß)ij + eijk \quad i = 1,2,3,4 \quad . \quad j = 1, 2$

Xijk = Average Effect Observed

μ = Total Average

ά I = Effect of Substitution SSM for SBM

ßj = Effect of Phytase Enzyme

(ά +ß)ij = Interactions (SSM × Phy)

eijk = Effect of Errors

3. Results and discussion

Data of feed intake, broiler weight and FCR are in (Table 3). Data showed significant difference about Feed intake in trial groups. Chicks were fed with T3 diet was higher FI among others groups. (SSM ×Phy) Interaction lead to higher feed intake on T3 . Addition Phy enzyme didn't significant effect on FI.Bw Gain in control groups was higher than others significantly ($p<0.05$). In fact, consumption of SSM increased FCR and addition of Phytase couldn't any benefit effect for FCR. Some researchers that showed live body weight and body weight gain of 6-week old broiler chicks fed the control diet were significantly ($P \leq 0.05$) higher than those of all other dietary treatments. However, body weights and body weight gains of broilers fed diets containing 50% of either SSM or soybean meal SBM were significantly lower than those of the control diet (Yamashita K., et al, 1992; Yamashita K., et al, 1995).phytase levels lower than 500 FTU/kg had no impact feed intake and feed conversion efficiency. (Alharti et al, 2009) showed That although all diets utilized in their studies were formulated to be Isocaloric. There was a very huge variation in all performance criteria. This might be due to multiple reasons , 1- SSM dietary levels used were very high and caused a poor performance as a result of higher dietary SSM in conjunction with the poor amino acids quality in SSM and 2- There might be a variation in the determined TME values of SSM. he higher TME value for the sesame seed cake diets (15.2 MJ kg-') as compared to the SBM diets (14.8 MJ kg-') may have contributed to the improved performance observed for the SSM fed broilers. However, these reported data utilized lower dietary SSM levels than dietary SSM levels used in our trial. Phytase supplementation of Corn and Soybean meal based diets has been reported to improve BWG and FCR (Yamashita K., et al ,2006).The differences in the rate of feed intake as shown in the various treatments indicates that it was influenced by the amount of SSM present in the diet. On Yamauchi et all researches feed intake tended to increase with increasing dietary SSM level, it was not significant different among the 0, 10, 20, and 30% dietary SM groups Compared with the 0% dietary SSM group, they noticed The lack of improved growth performance, even in the high protein diets, might be related to the composition of the SM. Sesamin, a lignanin sesame seed oil, does not affect BW gain or feed intake at the 0.5% dietary diet level (Yamashita K., et al ,1995).(Hossain and Jauncey ,1989) suggested that the high phytic acid content of SM is a possible reason for its lower apparent protein digestibility. These reports indicate that lack of improved growth performance, even after feedings of the high protein diets in this study, could be caused by low protein digestibility due to the phytic acid in the SSM.The requirement of

available P for broilers beyond 6 weeks of age is lower for growth performance than tibia ash (Gordon.R.W, 1998).Yamauchi et all that showed increase of use SSM lead to increase amount of feed in broilers but this increase is not significant (Yamashita K., et al ,1995; Yamashita K., et al , 2006). (Mehmet et al, 2005) that showed addition of Phytase enzyme can be useful on Increase in body weight. Similar findings were reported by previous research who reported (Sebastian.S et al.1998; Yi,Z.,E.T et al,1996; Zhaoguo.X.FZ. et al,2002) that phytase supplementation to broiler diets caused numerical improvement in feed efficiency of broilers fed a P-deficient diets fed without phytase.

Table 3
The effect of use SSM ×Phy on broilers performance (0-49) days.

Treatments	FI(Kg)	BW(Kg)	FCR (%)
SSM			
Control	90.7c	47.9a	1.89c
T1	94.0b	48.3a	1.93c
T2	95.8a	43.2b	2.20b
T3	95.9a	41.3c	2.30a
MSE	0.44	0.56	0.022
Phytase Enzyme (500FTU /Kg)			
E0	94.1a	45.0a	2.09a
E1	94.2a	45.4a	2.08a
MSE	0.31	0.40	0.015
(SSM ×Phy) Interaction			
Control× E0	90.3c	47.1a	1.91c
Control × E1	90.1c	48.6a	1.87c
T1× E0	93.4b	48.1a	1.93c
T1× E1	94.6ab	48.6a	1.93c
T2× E0	96a	43.5b	2.20b
T2× E1	95.7a	43b	2.20b
T3× E0	96.5a	41.2b	2.33a
T3× E1	95.5a	41.4b	2.30a
MSE	0.73	0.80	0.031

*Means within row with no common on letter are significantly different ($p<0.05$).

Data from (Table 4) showed bed moisture was increasing none significantly when increasing addition of SSM on broilers diets. This is may be due to the amount of protein in SSM that it needs more water is excreted from the body. In addition amount of water in SSM is high and this could increase litter moisture (Darrell J. et al, 1997). Antibody titers against New Castle Vaccine were measured and data from this test showed that antibody titers were not significantly differences when broilers fed with higher content of SSM .Data from Phosphorus digestibility that showed use Phytase enzyme can increase phosphorus digestibility significantly and PDI was higher on control groups. These results can be explained by that phytase enzyme had a positive influence on gastrointestinal tract digestive enzymes that leads to the increase in p digestibility observed in birds fed with SSM diets (Rutherfurd.SM. et al, 2002). Using enzyme lead to increase phosphorus digestibility in T1 but on T2 and T3 Was Unable to perform useful, this may be due to the low FTU of enzyme that we used.

The findings of the present study on serum components (Table 5) indicated that there were significant influenced for serum calcium, and inorganic phosphorus by the dietary treatments. The Ca and P in blood and tibia ash were higher when broilers used SSM and phytase enzyme together. Addition of phytase changed amount of Ca and P in blood and tibia ash significantly ($p<0.05$).bird fed diet without SSM had the lowest Ca and P levels in their blood. Phytase supplementation had a significant effect on tibia Ca and P level while it had no effect on Ca level in broiler bloods.SSM has extended levels of phosphorus bounded by phytate (Dan. B,2008; Deyab, D. M et al ,2009).The percentage of broilers tibia crude ash was significantly increased by the addition of dietary phytase. This agrees with the previous studies dealing with broilers. Phytase supplementation to diets increased the

content of Ca and P in the tibia compared to diets containing low P. This is a good indication of increased availability of P from phytase mineral complex by the action of phytase (Sebastian.S, 1998; YoungL.G, 1993).

Table 4
The effect of use SSM × Phy on phosphorous digestibility, Bed moisture and HI test.

Treatments	P.DI (%)	B.M (%)	HI (log2)
SSM			
Control	51.9a	20.9d	4.51a
T1	51.4a	22.8c	4.50a
T2	49.5b	24.9b	4.50a
T3	48.1c	27.1a	4.50a
MSE	0.25	0.14	0.043
Phytase Enzyme (500FTU /Kg)			
E0	49.8b	24.30a	4.53a
E1	50.6a	23.64b	4.53a
MSE	0.177	0.10	0.031
(SSM ×Phy) Interaction			
Control× E0	51bc	21.5e	4.53a
Control × E1	52.3a	20.4f	4.49a
T1× E0	50.7c	23d	4.53a
T1× E1	52.1a	22.6d	4.57a
T2× E0	49.4d	25.3b	4.51a
T2× E1	49.5d	24.6c	4.49a
T3× E0	48.1e	27.3a	4.53a
T3× E1	48.2e	26.9a	4.48a
MSE	0.35	0.20	0.062

*Means within row with no common on letter are significantly different ($p<0.05$).

Phytate is the form in which large portion of phosphorus is present in plant feed ingredients. This makes it difficult for non ruminants to gain their requirements out of being fed with these ingredients(Zhaoguo.X.FZ.Hua ,2002).Phytase can help in improving the availability of phytate bound phosphorus and reducing phosphorus levels in excreta from intensive livestock operations(Al Harthi et al ,2009; Kies,A.K et al,2001).

Effect of use SSM and Phytase enzyme on some part of broilers organs were investigated. We showed that carcass yield decreased by using SSM and Phytase supplementation had no effect on percentages of all cuts. This result agrees with previous findings of (Al Harthi et al, 2009; Kies,A.K et al,2001; Gordon.R.W,1998; Sebastian.S.,1998) that showed that phytase supplementation significantly increased percentages of most of carcass merits compared to P-deficient diets. By substitution SSM and Phytase percentage the liver weight percentage was increased significantly. The percentage of abdominal fat was decreased when we used SSM and Phytase enzyme the percentage of abdominal fat was at lowest when SSM consumption was at higher content.

As result was relevant (Table 7) small intestine mucosa and sub mucosa diameters were significantly increased when we applied T1,T2,T3 diets for them ($p<0.05$). Musclaris and serosa parts diameter were higher in T3 than others. Data from this study showed use of Sesame meal in broilers diets cause increase total diameter of small intestine parts ($p<0.05$). InYamauchi et al (Yamashita K., et al ,1992; Yamashita K., et al ,1995) Research Epithelial cells proliferations were reduced by reduction in energy and nutrient (Yamashita K., et al ,1992; Yamashita K., et al ,1995 intakes, and fat exerted a strong stimulatory effect for intestinal mucosal regeneration. Most values of the intestinal villus height, epithelial cell area, and crypt cell mitosis numbers were not different among groups for each intestinal Segment. Flat epithelial cells were on the intestinal villus apical surface in the group fed 0% dietary SSM. Considerations for current growth performance and histological intestinal alterations suggest that the SSM would have no detrimental effect on the growth performance with up to 20% dietary SM nor on the intestinal villi with up to 30% dietary SSM, but hypertrophy was observed in the epithelial cells of bird fed up to 20% dietary SSM (Yamashita K., et al, 1992; Yamashita K., et al, 1995; Yamashita K., et al, 2006).

Table 5
The effect of use SSM × Phy on calcium and phosphorous (blood and tibia ash).

Treatments	Ca Blood	P Blood	Ca Tibia	P Tibia
SSM	Mg/dl	Mg/dl	%	%
Control	10.2a	6.57d*	30.5a	11.40b
T1	10.3a	7.01c	30.4a	12.35a
T2	10.3a	7.24b	30.1b	12.51a
T3	10.3a	7.40a	29.7c	12.50a
MSE	0.06	0.02	0.061	0.06
Phytase Enzyme				
(500FTU /Kg)				12.05b
E0	10a	6.98b	29.7b	
E1	10.4a	7.13a	31.2a	12.25a
MSE	0.04	0.016	0.043	0.042
(SSM ×Phy) Interaction				
Control× E0	10c	6.40g	30.6b	11.11c
Control × E1	10.2a	6.75f	31.3a	11.70b
T1× E0	10.2a	6.95e	30.2c	12.29a
T1× E1	10.4a	7.06d	31.1a	12.41a
T2× E0	10.2a	7.18c	30c	12.50a
T2× E1	10.3a	7.30b	31.1a	12.43a
T3× E0	10c	7.40a	30c	12.23a
T3× E1	10.3a	7.41a	30.4b	12.40a
MSE	0.08	0.033	0.086	0.084

*Means within row with no common on letter are significantly different (p<0.05).

Table 6
The effect of use SSM × Phy on percentage some part of chickens' body.

Treatments	Carcass	Liver	Abdominal fat
SSM	%	%	%
Control	71a*	1.91d	1.99a
T1	69a	2.13c	1.60b
T2	67c	2.27b	1.50b
T3	65d	2.36a	1.34b
MSE	0.002	0.02	0.12
Phytase Enzyme			
(500FTU/Kg)			
E0	68a	2.14a	1.62a
E1	68a	2.19a	1.59a
MSE	0.001	0.016	0.84
(SSM ×Phy) Interaction			
Control× E0	71.5a	1.88e	1.97ab
Control × E1	71b	1.93e	2.01a
T1× E0	70c	2.11d	1.60bc
T1× E1	69.5d	2.15d	1.60abc
T2× E0	67.8e	2.23c	1.54c
T2× E1	67.5f	2.31b	1.46c
T3× E0	65.3h	2.34ab	1.38c
T3× E1	65.5g	2.39a	1.30c
MSE	0.003	0.033	0.17

*Means within row with no common on letter are significantly different (p<0.05)

Table 7
The effect of use SSM × Phy small intestinal morphology.

Treatments	Mucosa , Sub Mucosa	Musclaris	Serosa	Total
SSM	(micron)	(micron)	(micron)	(micron)
Control	111.8c*	12.1a	7c	130.9c
T1	112.8cb	12.1a	7.1cb	132c
T2	115.5b	12.2a	7.3ab	135b
T3	120.3a	12.05a	7.4a	139.8a
MSE	0.97	0.034	0.08	0.78
Phytase Enzyme (500FTU/Kg)				
E0	115.4a	12.16a	7.3a	134.8a
E1(	114.8a	12.07a	7.1a	133.9a
MSE	0.68	0.024	0.055	0.55
(SSM ×Phy) Interaction				
Control× E0	112.2bc	12.2a	7.5a	131.9c
Control × E1	111.9bc	12a	6.95d	130.7c
T1× E0	112.9bc	12.1 a	7.2bc	132.2c
T1× E1	112.6bc	12.11a	7cd	131.7c
T2× E0	115.5b	12.22a	7.4ab	135.1b
T2× E1	115.5b	12.20a	7.2bc	134.9b
T3× E0	121a	12.11a	7.5a	140.6a
T3× E1	119.6a	12a	7.3ab	138.9a
MSE	1.37	0.049	0.11	1.11

*Means within row with no common on letter are significantly different ($p<0.05$).

4. Conclusion

We could be explained by the facts that sesame meal can benefit acts on performance for broilers chicks. This improvement may be due to the biological functions of Sesame meal to improve growth or that may be due to its role as stimulant, carminative, enhanced digestibility, anti-microbial properties and it can be used as a good source of protein in substitution for soybean meal in broiler diets. Results of this study are in agreement with previous findings reported by (Kanekol.K, 2002) and (Yamashita K., et al, 1992; Yamashita K., et al, 1995; Yamashita K., et al, 2006).

Results of this study indicate that SSM can be use at 25% level to replace with SBM in the diet of broilers without adverse effects on the productive performance, blood parameters, carcass components of the birds. Using SSM amounts above 25% in broiler diets can be harmful. Because it has extended amount of phytate which can bound protein and minerals and make them unavailable for broilers. To solve this problem we recommend higher FTU of enzyme for more availability of nutrients .Further tests are needed to explore and more detail explanation.

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References

Agbulu, O., Gyau, A.M., Abakura, J.B., 2010. Effect of the Replacement of Sesame Seed for Methionine in Broiler Production in Middle Belt Region , Nigeria. J. Emerg. Trends Educat. Res. Pol. Stud., (1), 16-21.

Al Harthi, M.A., El Deek, A.A., 2009. Evaluation of sesame meal replacement in broiler diets with phytase and probiotic supplementation. Egypt. Poult. Sci. J . Vol., 29 No. 1 pp. 99-125

AOAC., 1994. Official Methods of Analysis Association of Agricultural Chemists Virginia, D.C., U.S.A, Chapter4,1-40.

Cheng, Y.H., Goff, G.P., shell, J.L., 2006. Utilization solanum glaucophylm and phytase to improve phosphorous utilizationin in broilers. J. Anim. Sci., 79, 544 .

Christopher, B.B., Joern, D.R., Adeola, O., 2003. Phytase ,high available Phosphor Corn, and Storage Effects on Phosphorus Levels in Pig Excreta. J. Env., 32, 1841-1849.

Dan, B., 2005. Sesame Profile. http, www.Agmrc. org.

Darrell, J.B., Minkang, Z., Ervin, T.K., 1997. Economic Returns from Reducing Poultry Litter Phosphorus with Microbial Phytase. J. Agr. Appl. Econom., 29, 2. 255-266.

Deyab, D.M.S., El-Saidy , S., Mahmoud, H., Mostafa, A.E., Hayam, D.T., 2009. Nutrition evaluation of sesame seed meal, Sesamum indicum (L.) as alternative protein source in diets of juvenile mono sex Nile tilapia (Oreochromis niloticus). Egypt. J. Aquat. Biol. Fish., Vol. 13, No. 1, 93 -106.

Farran.M.T.G.,Uwayjan, A.M., Ashkarian, V.M., 2000. Performance of broilers and layers fed graded level of sesame hull. J. Appl. Poul. Res., 9, 453-459.

Fenton,T.W., Fenton, M., 1979. Determination of chromic oxide in feed and feces. Canadaian J. Anim. Sci., 58,631.

Fukuda, Y., Nagata, M., Osawa, T., Namiki, M., 1986. Chemical aspects of the anti oxidative activity of roasted sesame seed oil and the effect of using the oil for frying. Agr. Biol. Chem., 50, 857–862.

Gordon,R.W., Ronald,D., 1998. Influence of supplemental phytase calcium and phosphors utilization on lying hens. Poul. Sci., 77,290-294.

John, G., 1996. Phytase effect on mineral utilization in weaning pig. Explored Feed stuff., 22,15.

Hossain,M.A.,Jauncey,K.,1989.Nutritional evaluation of some Bangladeshi oil seed meals as partial substitutes for fi sh meal in the dietof common carp,Cyprinus carpioL.Aquaculture Fisher. Manag., 20, 155-268.

Hirose, N., Inoue, T., 1991. Inhibition of cholesterol absorption and synthesis in rats by sesamin. J. Lip. Res., 4, 629-638.

Kang, M.H., 1998. Sesamolin inhibits lipid per oxidation in rat liver and kidney. J. Nutrit., 6, 1018-1022.

Kies, A.K., FVanhemert, K.A., Sauer, W.C., 2001. Effect of phytase on protein and amino acid digestibility and energy utilization. World's Poul. Sci., 57, 109-124.

Kanekol, K., Yamasakil, K., 2002. Effects of dietary sesame meal on growth, meat ingredient and lipid accumulation in broilers. J. Poul. Sci.,39,56-62.

Lease, J.G., 1966. Effect of autoclaving sesame meal on its phytic acid content and on the availability of its zinc to the chick. Poul. Sci., 45,237-241.

Lease, J.G.B.D., Barnett, E.J., Lease., Turk D.E., 1960.The Biological Unavailability to the Chick of Zinc in a Sesame Meal Ration. J. Nutrit.,72,66-70.

Mamputo, M., Buhr, R.J., 1995. Effect of substituting sesame meal for soybean meal on layer and broiler performance. Poul. Sci., 74, 672-684.

Manangi, M.K., Coon, C.N., 2006. Evaluation of Phytase Enzyme with Chicks Fed Basal Diets Containing Different Soybean Meal Samples. J. Appl. Poul. Res., 2, 292-306.

Mehmet, C., Dalkilik, B., Aliazman, M., 2005. Effect of microbial phytase supplementation on feed consumption and egg production of lying hens. J. Poul. Sci., 10, 758-760.

Moazzami, A., 2006. Sesame feed lignans.doctoral thesis,swedish university of Agricultural Science, 98,1-62.

Mokopohyay.N.RAY.A.K(1999)Effect of fermentation on the nutritive value of sesame seed meal in the diets for rohu, Labeo rohita fingerling. Aquaculture Nutrit., 5, 220–226.

Mokopohyay, N.S., Bandiopadhaya., 2003. Extrusion cooking technology employed for reduces anti nutritional factor tannin in sesame. J. Food Eng., 56,201-202.

Namkung, H., lesson, S., 1999. Effect of phytase enzyme on dietary AMEn and ileal digestibility of nitrogen and amino acids in broiler chicks. Poul. Sci., 78,1317-1320.

Namiki, M., 1995.The chemistry and physiological functions of sesame. Food Rev. Int., 11, 281–329.

Nelson, T.S., Ferrara, L.W., Storer, N.l. 1968. Phytate content of feed ingredients derived from plants. Poul. Sci., 147,1372–1374.

Nibedita, M., Bandiopadhaya, S., 2003. Extrusion cooking technology employed for reduce anti nutritional factor tannin in sesame . J. Food Eng., 56, 201-202.

NRC., 1994. Nutrient requirements of poul. Nat. Academy Press.Washington,DC. Ninth Rev. Edit.

Partha, G.H., Ghoshal, P.T., 2005. Polysaccharide from sesamum indicum meal. Isolate. Struct. Feat. Food Chem., 90, 719.

Peter, H.S., Scott, T., 2006. Influence of dietary phytate and exogenous phytase on amino acid digestibility in poultry. J. Poul. Sci., 43, 89-103.

Peter, H., Selle, A., Velmurugu, R., 2007. Microbial phytase in poultry nutrition. Anim. Feed Sci. Technol., 135.1-41.

Pinhas, L., Kinsella, J.E., 1991. Study of the hydration process in tehina. Food Chem., 43, 301-319.

Ralf, G., Konietzny, U., 2006. Phytase for food application. Food Technol. Biotechnol., 44, 125-140.

Robert.R.B. J.l,Emmert, and B.David(1997)Iron bioavailability in soybean as affected by supplemental phytase. Poultry Sci., 76, 1424.

Rutherfurd, S.M., Moughan, P.J., 2002.Effect of Microbial phytase on illeal phosphorus and amino acid Digestibility in the broiler chicken . Brit. Poul. Sci., 44, 598-606 .

Institute, S.A.S., 1992. SAS User's Guide, Statistics.Version 6 Edit. SAS Inst. Inc., Cary, NC.

Sebastian, S., Touchburn, S.P., Chavez, E.R., 1998. Implications of Phytic acid and supplemental microbial phytase in poultry Nutrition, A review, J. World Poul. Sci., 54, 27-47.

Sing, M., Krikorian, A.D., 1982. Inhibition of trypsin activity by phytate. J. Agr. Food Chem.,30,799-800.

Weaver, C.M., Berdine, M.R., Ebner, J.S., Krueger, C.A., 1987. Oxalic acid decreases calcium absorption in rats. J. Nutrit.,117, 1903.

Yamashita, K., Nohara, Y., 1992. Sesame seed lignans and gamma-tocopherol act synergistically to produce vitamin E activity in rats. J. Nutrit., 12, 2440-2446.

Yamashita, K., Iizuka, Y., 1995. Sesame seed and its lignans produce marked enhancement of vitamin E activity in rats fed a low alpha-tocopherol diet. J. Lipids., 30, 1019-1028.

Yamauchi, K., Samanya, M., Thongwittaya, N., 2006. Influence of dietary sesame meal level on histological alterations of the intestinal mucosa and growth performance of chickens. J. Appl. Poul. Res., 15, 266-273.

Yalcin, S., Onol, A.G., 1994. True metabolizable energy values of some feeding stuffs. Brit. Poul. Sci., 35,119-122.

YoungL, G., Leunissen, M.L., Atkinson, J.L., 1993. Addition of microbial phytase to diets of young pigs. J. Anim. Sci., 71, 2147-2150.

Yi, Z., Kornegay, E.T., Denbow, D.M., 1996. Supplemental Calcium, magnesium ,zinc and protein in piglets. Microbial phytase improves zinc utilization in broilers. J. Poul. Sci., 75, 540–546.

Yung-Shin, S.H., Hwang, L., 2002. Anti oxidative activity of the crude extract of lignin glycosides form unroasted burma black sesame meal. Food Res. int., 35, 357-365.

Zhaoguo, X., Hua, F.Z., ding, W.Y., 2002. the effect of supplemental microbial phytase in diet on growth performance and mineral excretion of Rex Rabbits. Colage Anim. Sci., 1114- 1120.