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European Journal of Experimental Biology, 2013, 3(3):233-235

ISSN: 2248 –9215
CODEN (USA): EJEBAU

The effect of different levels of pasta by product with or without enzyme on performance of broiler chickens

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ABSTRACT

*This study was conducted in order to evaluate the effect of four levels of pasta by product including 0, 10, 20 and 30 percentage of diet with or without enzyme on performance of broiler chickens using a 2*4 factorial design with 4 treatments and 3 replicates. During the experiment, chickens received feed and water of free access. Weight gain and feed consumption were measured at each period and feed conversion ratio was calculated. Feed consumption, weight gain and feed conversion ratio were not affected by various levels of pasta by product ($p>0.05$) but weight gain was significantly affected by using enzyme in diet ($p<0.05$). The results of this study indicated that using different levels of pasta by product had not significantly effect on performance of broiler chickens.*

Key words: pasta by product, enzyme, performance, broiler chicken

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INTRODUCTION

Many of by products of food industries is a valuable sources of nutrients and with respect to the relatively high production of these by products in some regions, they can have important role at poultry diets. One of these uncommon by product that is used at animal nutrition is pasta by product. Most of this by product is produced during cutting and packaging of product. (Moghadam et al, 2005).

The cost of nutrition is about 60 to 70 percentage of total cost of poultry husbandry. One of the ways to reducing this cost is use of different by products of agricultural products processing industries for example by products of pasta and flour factories.(Gheisari et al,2003). Some of feedstuffs at poultry diets have extensive amount of phytic acid and other antinutrients that may reduce digestibility and availability of feeds nutrients. Hence nowadays exogenous enzymes are used extensively in order to increase digestibility and bioavailability of nutrients (Zaghari, 2006).

In a study by Gheisari et al (2003) the effect of feeding wheat middlings and pasta by product on performance of broiler chickens were investigated and results showed that different levels of pasta by products had not a significant effect on feed consumption of broilers but the highest weight gain was obtain in broilers fed pasta by product at level of 16 and 24 percentage of diets.

Jahanian et al (2007) suggested that use of enzyme with pasta by product may improve nutritive value of the diet and also they concluded that pasta by product is a energy source in poultry diets.

Our objective was to evaluate the effect of different levels of pasta by product with and without enzyme on performance of broiler chickens.

MATERIALS AND METHODS

In this study 144 one day old Ross 308 broiler chickens were used. All birds fed commercial starter diet during starter period (1-10 day). At day 10 chicks were weight and distributed to 24 groups of 6 chicks in such a way that the mean of their weight at experimental groups were similar. This experiment was conducted use of 2*4 factorial arrangements on the bases of completely randomized design with 4 treatments and 3 replicates. Treatments included use of pasta by product at level of 0, 10, 20 and 30 percentages of diets with and without enzyme. During the experiment, feed consumption and weight gain were measured at each period and feed conversion rate was calculated. Experimental diets were balanced according to recommendations of ross 308 catalog and the value of apparent metabolizable energy corrected for nitrogen (AMEn) for pasta by product (3766 kcal/kg) was used according to findings of Einollah Abdi Ghezelche(2008) obtained by Leghorn roosters. Diets were formulated using UFFDA software.

Data were analyzed using SAS (2006) software and Mean separations were performed using Dunckan test with a predetermined significance level of $P<0.05$.

RESULTS AND DISCUSSION

Our results showed that pasta by product has not a significant effect on performance of broiler chickens during growing period (Day 10 to 24). During the experiment, no effect of experimented diets was observed on feed consumption and weight gain which is in agreement with results reported by previous studies (Moghadam et al 2005; Gheisari et al, 2003).

In this study birds that fed diet containing 10% pasta by product have highest weight gain (Table 2). These results are not in agreement with results of Moghadam et al (2005) that reported use of pasta by product at level of 24 percentage of diet may improve weight gain. High temperature of processing during producing of pasta may result in destroyed of vitamins, minerals and reduced utilization of its protein. Hence use of this by product in broiler diets is limited in compare with corn.

Adding enzyme to the diet may result in increased feed consumption in birds that fed with a diet containing 30 percentage of pasta by product with enzyme ($p<0/05$) (Table 3). These results are in agreement with findings of Jahanian et al (2007) but are in contrast with results reported by Gheisari et al (2003). With increase of pasta by product in diet and increase of non starch polysaccharides content, adding enzyme to the diet may improve feed consumption and reduce negative effects of carbohydrates in broiler chickens diet (jahanian et al,2007).

Table 1. The composition of experimental diet for 10 to24 and 24 to42 day-old broilers (g/kg)

	level of waste macaroni(%)							
	Growing period				Finishing period			
Item	0	10	20	30	0	10	20	30
Corn	58.21	52.27	41.34	30.43	62.48	56.43	45.66	34.88
Soybean meal	35.61	33.99	34.82	7.82	31.64	30.06	30.76	31.67
Soybean oil	2.42	-	-	-	1.160	-	-	-
pasta by product	-	10	20	30	-	10	20	30
Dcp	1.49	1.38	1.33	1.27	1.38	1.27	1.21	1.16
Salt	0.18	0.2	0.19	0.22	0.18	0.18	0.19	0.19
NaHco3	0.24	0.19	0.22	0.18	0.23	0.22	0.22	0.21
Caco3	1.05	1.13	1.22	1.31	1.02	1.1	1.19	1.28
DL met	0.23	0.24	0.26	0.28	0.18	0.19	0.21	0.23
L lys	0.07	0.11	0.13	0.15	0.02	0.05	0.07	0.09
Vitamin premix	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Mineral premix	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100	100	100	100
ME (Kcal/Kg)	2950	2950	2950	2950	3000	3000	3000	3000
CP (%)	20.61	20.66	20.37	22.08	19.23	19.295	19.95	20.61
P(%)	0.422	0.437	0.451	0.421	0.395	0.408	0.422	0.393
Cl(%)	0.164	0.155	0.175	0.149	0.15	0.155	0.16	0.15
Na(%)	0.15	0.155	0.16	0.149	0.15	0.155	0.16	0.15
Ca (%)	0.842	0.845	0.873	0.903	0.796	0.799	0.826	0.854
Met (%)	0.55	0.553	0.575	0.517	0.485	0.486	0.507	0.527
Lys (%)	1.161	1.164	1.204	1.244	1.021	1.025	1.06	1.095
Met+Cys (%)	0.889	0.893	0.924	0.953	0.806	0.888	0.836	0.864

1. Vitamin premix (content per kg diet): Vit. A, 15,000 IU; Vit. D3, 3,000 ICU; Vit. E, 30 mg; Vit. K3, 4 mg; Thiamine, 3 mg; Riboflavin, 8 mg; Pyridoxine, 5 mg; Vit. B12, 25 mcg; Ca-pantothenate, 19 mg; Niacin, 50 mg; Folic acid, 1.5 mg; Biotin, 60 mcg.
2. Mineral premix (content per kg diet): Co (CoCO3), 0.255 mg; Cu (CuSO4 · 5H2O), 10.8 mg; Fe (FeSO4 · H2O), 90 mg; Mn (MnSO4 · H2O), 90 mg; Zn (ZnO), 68.4 mg; Se (Na2SeO3), 0.18 mg.

Table 2. Effect of different levels of pasta by product on broiler performance

	% waste				*enzyme*	
	0	10	20	30	0	0.05
BWG	647.64	657.47	656.17	649.17	634 b	671.46 a
(SEM)	8.24				8.24	
P-value	0.9405				0.0163	
FI	1.139	1.158	1.135	1.152	1.135	1.157
(SEM)	0.0082				.0082	
P-value	0.5831				0.1101	
FCR	1.761	1.756	1.726	1.778	1.788	1.723
(SEM)	0.0184				0.0184	
P-value	0.8122				0.1082	

BWG: Body weight gain, FI: Feed intake, FCR: Feed conversion ratio
Means with different superscripts in each column are significantly different

Table 3. Effects of interaction different levels of enzyme and pasta by product on broiler Waste levels

	% waste levels							
	0		10%		20%		30%	
Enzyme level	0	0.05	0	0.05	0	0.05	0	0.05
BWG	c 601.113	a 694.163	abc 654.613	ab 660.333	ab 660.556	abc 452.720	bc 619.723	ab 678.613
(SEM)	8.24							
P-value	0.0718							
FI	c 1.102	ab 1.174	ab 1.178	abc 1.139	abc 1.144	bc 1.127	c 1.117	a 1.188
(SEM)	0.0082							
P-value	0.0126							
FCR	1.83	1.69	1.79	1.72	1.73	1.72	1.80	1.75
(SEM)	0.0184							
P-value	0.675							

BWG: Body weight gain, FI: Feed intake, FCR: Feed conversion ratio
Means with different superscripts in each column are significantly different

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