Effect Of Olive Cake, Sugar Beet Pulp And Dried Brewer's Grain Supplementation In Growing Rabbit Diets On Growth Performance, Digestibility And Caecum Activity

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ABSTRACT

This work was carried out to study the effect of olive cake, sugar beet pulp and dried brewer's grain supplementation in growing rabbit diet on growth performance, digestibility and caecum activity. Fifty six newly weaned rabbit 35 days of age and nearly equal in their weights were used in the present study. the animals were randomly divided into seven groups (eight animals in each) reared on seven balanced experimental diets as follow Group 1 fed on basal diet (Control), Group 2 fed on basal diet with 15% olive cake meal , Group 3 fed on basal diet with 15% olive cake meal+ kemzyme plus (0.5 kg / ton), Group 4 fed on basal diet with 15% sugar beet pulp , Group 5 fed on basal diet with 15% sugar beet pulp + kemzyme plus (0.5 kg / ton) , Group 6 fed on basal diet with 15% dried brewer's grain, Group 7 fed on basal diet with 15% brewer's grain dried + kemzyme plus (0.5 kg / ton). The experimental diets were fed to growing rabbits from weaning to the end of the experimental period (8 weeks).

The results revealed that supplementation of rabbit's diets with olive cake, sugar beet pulp and dried brewer's grain with enzymes significantly improved growth performance, nutrient digestibility. PH, total volatile fatty acids and ammonia in growing rabbit caecum were also significantly affected by the experimental diets. Group fed on olive cake supplemented with enzyme recorded the highest values of body weight, feed consumption and feed conversion ratio (2537.1, 111.21 gm and 3.09%) respectively. Also the same group revealed the best values of digestion coefficient for dry matter (DM) and crude protein (CP) (68.74 and 73.02%), dried brewer's grain for organic matter (OM) and dried brewer's grain supplemented with enzyme for crude fiber (CF)). (70.41, 47.63) respectively.

INTRODUCTION

In recent years, the domestic rabbits have been recommended as a good alternative source of dietary protein for increasing human population in developing countries. Now there is evidence that some developing countries are beginning to utilize the rabbit as a main source of meat. But the main problem in animal production in Egypt is the high cost and shortage of animal feed stuffs. At the same time, many thousand tons of wastes/year are produced from processing of vegetables, fruits and plants such as olive cake, sugar beet pulp and dried brewer's grain .these wastes can be used in rabbits nutrition as unconventional feeds stuffs as a partial substitute for the conventional grains and forages *(1,2)*.

The objective of this work was to investigate the effect of unconventional feeds used on growth performance (body weight, average daily gain and feed conversion ratio) as well as, determination of nutrient digestibility and study the effect of feeds used on pH, ammonia level and total volatile fatty acids of rabbit's caecum.

MATERIALS AND METHODS

A total number of 56 weanling white New Zealand rabbits of 35 day old, were divided into seven groups (8 each). as follow Group 1 Fed on basal diet (Control), Group 2 Fed on basal diet with 15% olive cake meal , Group 3 Feed on basal diet with 15% olive cake meal+ kemzyme plus (0.5 kg / ton), Group 4 Fed on basal diet with 15% sugar beet pulp , Group 5 Fed on basal diet with 15% sugar beet pulp + kemzyme plus (0.5 kg / ton), Group 6 Fed on basal diet with 15% dried brewer's grain, Group 7 Fed on basal diet with 15% dried brewer's grain + kemzyme plus (0.5 kg / ton).

The animals were raised in a battery system, naturally ventilated and provided with electric fans. The batteries were also accommodated with feeders and automatic drinkers. All animals were fed the control diet for one week to be accommodated with the new feed and rearing system, and then fed the experimental diets at daily regular time until the end of the experimental period. The animals fed isocaloric isonitrogenous diets *(3).*

Composition and chemical analysis of experimental diet was mentioned in Tables 1 and 2. Daily feed intake for each rabbit and that for each group were recorded and the average feed intake for each was calculated. Body weight and body weight gain were recorded every week. Feed conversion ratio was estimated weekly.

At the end of the experiment three rabbits from each group were fed the same experimental diets for 10 days to determine the digestibility of dry matter, organic matter, crude protein, crude fiber, ether extract and nitrogen free extract. Samples from feed and feces of each group were taken daily for chemical analysis *(4).* Digestibility was calculated according to classic formula *(5).*

At the end of the experiment three rabbits from each group slaughtered and directly measured caecum PH by using PH Metter. caecal content of the slaughtered animals was prepared *(6)* . Total volatile fatty acids and ammonia in rabbit caecum were determined by steam distillation of the distillate *(7, 8).*

Data were analyzed by the General Linear Model (GLM) procedure of the SAS statistical analysis system package *(9).* Least Squares Means (LSM) ± standard errors were calculated and tested for significance using "T" test *(10).*

Table 1. Composition of the experimental diets.

Ingredients	Experimental diets						
	Control	Olive cake 15 %		Sugar beet pulp 15%		Brewer's grain 15%	
		-ve kemzyme	+ ve kemzyme	-ve kemzyme	+ ve kemzyme	-ve kemzyme	+ve kemzyme
Hay	30.2	13.2	13.2	22.2	22.2	25.2	25.2
Corn	22	18	18	20	20	21	21
Soybean	15	18	18	17	17	10	10
Wheat bran	25	24	24	18	18	19	19
Wheat straw	3	3	3	3	3	3	3
Molasses	3	3	3	3	3	3	3
Vegetable oil	-	4	4	-	-	2	2
Premix	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Salt	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Limestone	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Methionine	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Olive cake	-	15	15	-	-	-	-
Sugar beet pulp	-	-	-	15	15	-	-
Brewer's grain	-	-	-	-	-	15	15
	100	100	100	100	100	100	100

*Premix : Every 3kg premix contain : Vit. A10.000.000 IU- Vit. D_3 3.000.000 IU – Vit. E 10.000 mg – folic acid 1000mg–Niacin 30.000mg– Pantothenic acid 1000mg– Vit K 1000 mg–Vit B_1 1000mg –Vit B_2 5000mg. Vit. B_6 1500 mg–Vit. B_{12} 10mg– biotin 50mg- iron 30.000mg- copper 4000mg– Zinc 50.000mg– mn 60.000mg- Iodine 300mg– Selenium 100 mg- choline chlorite 350.000mg.

Table 2. Chemical and calculated analysis of the experimental diet.

Ingredients	Experimental diets						
	Control	Olive cake 15 %		Sugar beet pulp 15%		Brewer's grain 15%	
		-ve kemzyme	+ ve kemzyme	-ve kemzyme	+ve kemzyme	-ve kemzyme	+ve kemzyme
D.M	89.00	88.45	88.45	88.27	88.27	88.08	88.08
O.M	92.40	91.56	91.56	90.41	90.41	90.63	90.63
C.P	16.1	16.2	16.2	16.6	16.6	15.9	15.9
C.F	14.3	14.5	14.5	14.6	14.6	14.2	14.2
E.E	2.23	7.00	7.00	2.70	2.70	5.60	5.60
N.F.E	59.77	55.15	55.15	56.51	56.51	60.53	60.53
ASH	7.60	8.44	8.44	9.59	9.59	9.37	9.37
D.E *	2598.94	2575.64	2575.64	2663.15	2663.15	2607.74	2607.74

* Digestible energy Kcal/ kg diet. Calculated according to ***MacDonald et al., (11).***

RESULTS AND DISCUSSION

Data in Table 3 showed the live body weight of New Zealand white rabbit as affected by the experimental diets, results in this table showed a significant difference in live body weight from 3rd week till the end of the experiment when compared to control. The average final body weight at 8 weeks of age for the different treatment groups were 2230, 2347, 2537.1, 2248, 2300, 2236.6 and 2277.5 g for the control group of rabbits and those having 15% olive cake meal (OCM), 15% OCM + enzyme, 15% sugar beet pulp (SBP), 15% SBP + enzyme, 15% dried brewer's grains (DBG) and 15% DBG + enzyme respectively and noticed that the highest live body weight (2537.1g) were obtained by group that feed on 15% olive cake meal with kem-zyme as feed additives. Also the groups that feed on beet pulp and dried brewer's grain with addition of kem-zymes respectively revealed high body weight (2300g) and (2271.5g) when compared with the control diet (2203 g).

New Zealand white rabbit fed on diets containing 5% olive cake meal (OCM), 10% OCM and 15% OCM and found rabbits fed ration containing 15% OCM had recorded the highest live body weight while the lowest value was obtained with those fed ration containing 10% OCM ***(1)***. Also this result agreed with the results of other studies ***(12-14).*** Moreover significant differences between groups fed 50, 75 and 100% olive kernel meal were recorded ***(15).***

The effects of the experimental diet on feed consumption are shown in Table 4. Data in the present study showed non significant differences in feed consumption among all groups. The highest feed consumption in this result is group that fed on OCM + enzyme but was not significant. These results consistant with previous study ***(1).*** The effect of olive cake meal and date stone at level 5, 10 and 15% from the diet increased feed consumption by increasing the level of OCM. In contrast rabbits fed diet containing OCM at 75% and 100% substitution of barley consumed significantly more feed than those fed either the control diet or the diet in which OCM replaced 50% of barley generally as a matter of fact, feed consumption increased as the rabbit grew older ***(15)***. Also this may be attributed to the crud fiber

and fiber fractions content of OCM (33%). this result confirmed other results *(13)* he reported that two pelleted diets were distributed during 8 weeks to two groups of fattening rabbits, the first (control diet) fed normal diet, the second (experimental diet) is formulated to contain the minimum of ingredients and the maximum of low cost by products available locally in order to come back cheep , it contains 61% of hard wheat bran and 20% of crud olive cake and found that increase in feed consumption 77.5 g/d and 87 g/d for control and treatment respectively.

Table 3. Effect of diets containing olive cake, beet pulp or brewer's grain with or without enzyme on body weight (g) of growing New Zealand White rabbit

Age (weeks)	Experimental diets						
	Control	Olive cake 15 %		Sugar beet pulp 15%		Brewer's grain 15%	
		-ve kemzyme	+ ve kemzyme	-ve kemzyme	+ve kemzyme	-ve kemzyme	+ve kemzyme
Initial	671±15.99^{a}	675±20.60^{a}	673±32.91^{a}	670±21.09^{a}	680±30.59^{a}	679±35.48^{a}	675±20.40^{a}
W1	799±25.27^{a}	811±40.92^{a}	830±85.37^{a}	820±26.84^{a}	832±46.63^{a}	801±96.38^{a}	806±28.02^{a}
W2	972±45.05^{a}	1004±29.96^{a}	1030±22.43^{a}	1009±22.87^{a}	1027.7±32.29^{a}	986.8±28.02^{a}	997.3±36.11^{a}
W3	1141±52.71^{b}	1223.5±29.09^{ab}	1276.6±25.75^{a}	1175.8±26.33^{ab}	1207.8±32.53^{ab}	1158.6±35.08^{b}	1164±36.79^{b}
W4	1332±10.15^{b}	1433±37.08^{a}	1525±32.32^{a}	1384±34.97^{a}	1413±32.28^{a}	1367±38.63^{a}	1377.5±27.24^{a}
W5	1579.75±42.38^{b}	1680.6±39.95^{ab}	1782±31.85^{a}	1597±44.61^{b}	1658±61.98^{ab}	1585±48.75^{b}	1618±36.93^{b}
W6	1858±39.08^{b}	1931±34.13^{b}	2069.7±29.30^{a}	1878±45.15^{b}	1895±59.55^{b}	1860±48.68^{b}	1879.8±40.90^{b}
W7	2048±53.16^{bc}	2139.5±39.04^{b}	2289±30.18^{a}	2052±35.16^{bc}	2073.7±4.18^{bc}	2050±36.14^{c}	2064±31.55^{bc}
W8	2230±49.91^{b}	2347±44.53^{b}	2537.1±41.46^{a}	2248.3±0.27^{b}	2300±43.58^{b}	2236.6±15.40^{b}	2277.5±36.44^{b}

* Means with different superscripts in each raw are different at level $p < 0.05$.

Table 4. Effect of diets containing olive cake, beet pulp or brewer's grain with or without enzyme on feed consumption (g/day /rabbit) of growing New Zealand White rabbit

Age (weeks)	Experimental diets						
	Control	Olive cake 15 %		Sugar beet pulp 15%		Brewer's grain 15%	
		-ve kemzyme	+ve kemzyme	-ve kemzyme	+ve kemzyme	-ve kemzyme	+ve kemzyme
W1	67±2.11^{ab}	65±4.42^{b}	69±3.51^{ab}	74±4.08^{a}	75±1.14^{a}	61.5±4.79^{b}	63±2.77^{b}
W2	97±1.04^{ab}	88±3.12^{c}	98±0.50^{a}	89.4±2.40^{c}	91±2.76^{bc}	93.7±2.18^{abc}	90±2.40^{c}
W3	96±3.13^{bc}	99±2.86^{ab}	106±1.85^{a}	90.4±1.84^{c}	95.5±1.77^{bc}	96.7±2.82^{bc}	93±3.83^{c}
W4	100.3±5.56^{b}	103±2.11^{ab}	110.61±0.83^{a}	101.32±3.96^{ab}	102.41±1.72^{ab}	106.91±2.61^{ab}	108±1.76^{ab}
W5	121±1.86^{a}	113.32±5.38^{ab}	110.26±2.15^{ab}	100.41±2.22^{bc}	108.98±3.72^{ab}	105.15±4.13^{bc}	102±9.36^{c}
W6	133.5±1.80^{a}	115±5.14^{bc}	123±4.67^{abc}	130.16±3.07^{a}	112.15±2.87^{c}	131±4.86^{ab}	124.5±3.02^{ab}
W7	131.2±2.14^{a}	127.61±3.32^{bc}	133.7±1.60^{abc}	118±3.71^{a}	118.93±4.94^{c}	130±1.81^{ab}	125.5±3.31^{ab}
W8	129±3.66^{a}	130.82±3.43^{a}	139.16±4.08^{a}	130.62±2.88^{a}	135.12±3.40^{a}	130.7±4.12^{a}	133.78±3.31^{a}
Overall mean	109.31±8.22^{A}	105.24±7.64^{A}	111.21±7.80^{A}	104.28±1.20^{A}	104.88±6.49^{A}	106.95±8.47^{A}	104.97±8.21^{A}

* Means with different superscripts in each raw are different at level $p < 0.05$.

The mean values of feed conversion efficiency (FCE) for rabbits as affected by experimental rations are presented in Table 5. From the results we found that group fed on 15% OCM + enzyme recorded the best value (3.09) followed by that fed on 15% olive cake meal only (3.18) then that fed on beet pulp 15% + enzyme (3.73) then that fed on dried brewer's grain 15% + enzyme (3.80), then that fed on 15% beet pulp (3. 83), then that fed on dried brewer's grains 15% (3.90) and finally the control give the poorest value (4.18). From these results there were a significant difference between groups ($P<0.05$). The effect of olive pulp supplementation in rabbit diet by 10% was studied and reported that rabbit fed diets contained olive pulp recorded an improvement in feed conversion when compared with those feed the control diet *(12)*.

Table 5. Effect of diets containing olive cake, beet pulp or brewer's grain with or without enzyme on feed conversion of growing New Zealand White rabbit

Age (week)	Experimental diets						
	Control	Olive cake 15 %		Sugar beet pulp 15%		Brewer's grain 15%	
		-ve kemzyme	+ve kemzyme	-ve kemzyme	+ve kemzyme	-ve kemzyme	+ve kemzyme
W1	3.76± 0.48^{a}	3.18±0.25^{a}	3.09±0.39^{a}	3.49±0.36^{a}	3.56±0.64^{a}	3.98±1.26^{a}	4.29±2.14^{a}
W2	4.51±1.73^{a}	3.21±0.14^{a}	3.42±0.26^{a}	3.45±0.92^{a}	3.66±1.01^{a}	2.76±0.84^{a}	3.34±0.62^{a}
W3	4.02 ± 0.39^{a}	3.22±0.45^{a}	3.14±0.59^{a}	4.13±1.08^{a}	3.69±0.03^{a}	3.95±0.32^{a}	3.78±0.19^{a}
W4	3.67± 0.11^{a}	3.44±0.16^{a}	3.31±0.33^{a}	3.41±0.09^{a}	3.50±0.21^{a}	3.63±0.53^{a}	3.54±0.01^{a}
W5	3.62±0.91^{a}	3.23±0.31^{a}	3.00±0.04^{a}	3.40±0.64^{a}	3.11±.04^{a}	3.42±0.46^{a}	2.97±0.08^{a}
W6	3.35±0.06^{a}	3.21±0.13^{a}	3.00±0.23^{a}	3.24±0.09^{a}	3.38±0.57^{a}	3.36±0.32^{a}	3.33±0.07^{a}
W7	4.90±0.62^{a}	4.54±0.99^{a}	4.40±0.66^{a}	4.76±0.35^{a}	4.78±0.79^{a}	6.02±0.71^{a}	4.80±0.48^{a}
W8	5.58±1.56^{a}	4.43±.41^{a}	3.98±0.51^{a}	4.80±0.74^{a}	4.17±.02^{a}	4.11±0.10^{a}	4.39±0.23^{a}
Overall mean	4.18±0.30^{A}	3.18±0.25^{A}	3.09±0.39^{A}	3.83±0.22^{AB}	3.73±0.19^{AB}	3.90±0.28^{AB}	3.80±0.26^{AB}

* Means with different superscripts in each raw are different at level $p < 0.05$.

The data in Table 6 showed that the digestibility of Nutrients are affected by the dietary level of either olive cake meal or sugar beet pulp or dried brewer's grains in the tested rations. Digestion coefficient of dry matter (DM) showed a significant differences ($P<0.05$) between treated groups and control group and the value ranged from 62.80% to 68.74% for control and group that supplemented with 15% olive cake meal + enzyme. It has been reported that digestion coefficients of diet nutrients for New Zealand white rabbits were ranged from 68.00 to 71.80% *(16)*.

The digestibility of organic matter (OM) in the present study showed a significant differences ($P<0.05$) and the highest value was 70.41% of group that fed on 15% DBR with enzyme addition and the lowest value was 64.73% of control group on contrary other study that demonstrate the effect of date seed and olive cake on digestibility in rabbit. *(1)* there was no significant difference in OM matter digestibility. Study the digestibility and nutritive value of sugar beet pulp showed that crud protein digestibility was affected negatively ($P<0.05$) *(17)*.

Digestibility coefficient of crud fiber (C.F.) in the present study showed a significant differences ($P<0.05$) and ranged from 47.63 to 29.35% for group that fed on 15% DBG + enzyme and control respectively from result there was a significant differences ($P<0.05$) between groups and control. We noticed that addition of kem- zyme to the diet results in

increasing crud fiber digestibility. The digestibility of sugar beet pulp, soybean hulls, wheat bran and citrus pulp in rabbit studied by *(17)* and reported that crud fiber digestibility was increased (P<0.05). The digestibility coefficient of crud fiber ranged from 25.2% in the control ration to 51.3% in that containing 10% olive cake meal. *(1)*

Ether extract (E.E) digestibility of the experimental rations showed a significant differences and the highest value was 77.35% of group that fed 15% DBG + enzyme. Digestibility of ether extract ranged from 70 to 91% *(18)* and from 74.0 to 80.1% for New Zealand white rabbits fed diets containing different levels of olive kernel meal and dried sweet pea hulls *(15)*.

Nitrogen free extract (NFE) digestibility showed a significant differences (P<0.05) and the highest value was (76.03) that feed on 15% dried brewer's grain and lowest value (70.13%) was of that fed on 15% sugar beet pulp + enzyme. Nitrogen free extract digestibility were ranged from 72.3% in the ration containing 15% olive cake meal to 79.8 % in ration containing 5% olive cake meal *(1)*. Also, other study evaluate the energy and protein of dried brewer's grain (BDG) produced from different proportion of Barley, maize and sorghum on the performance of rabbits and reported that the treatments effects was significant (P<0.05) with the highest crud protein digestibility and nitrogen retention values recorded for brewers dried grain (maize, barley and sorghum) the digestible energy values were insignificant (P>0.05) for the dried brewers grain investigated. *(19)*.

Table 6. Effect of diets containing olive cake, beet pulp or brewer's grain with or without enzyme on digestibility coefficient % of growing New Zealand White rabbit

Item	Experimental diets						
	Control	Olive cake 15 %		Sugar beet pulp 15%		Brewer's grain 15%	
		-ve kemzyme	+ve kemzyme	-ve kemzyme	+ve kemzyme	-ve kemzyme	+ve kemzyme
D.M	62.80± 0.07^{d}	67.05±0.01^{b}	68.74±0.11^{a}	66.66±0.41^{bc}	66.13±0.35^{c}	65.93±0.22^{c}	66.19±0.14^{c}
O.M.	64.73±0.24^{c}	68.28±0.12^{abc}	69.44±0.11^{ab}	67.24±0.19^{abc}	66.51±0.20^{bc}	70.41±2.81^{a}	66.92±0.07^{abc}
C.P.	66.66±1.94^{c}	71.38±1.42^{a}	73.02±0.93^{a}	71.49±0.52^{a}	71.05±0.28^{ab}	67.83±0.53^{bc}	67.04±0.90^{c}
C.F.	29.35±1.55^{c}	41.80±1.95^{b}	47.48±0.79^{a}	42.78±1.35^{b}	42.68±1.03^{b}	44.46±0.87^{ab}	47.63±0.15^{a}
E.E.	66.16±2.06^{a}	60.49±3.09^{a}	75.77±0.28^{a}	68.95±0.72^{a}	68.10±1.17^{a}	64.32±0.75^{a}	77.35±2.06^{a}
NFE	72.62±0.20^{c}	73.75±0.31^{bc}	73.52±0.40^{bc}	72.30±0.22^{c}	70.13±1.02^{d}	76.03±0.10^{a}	74.92±0.10^{ab}
Ash	41.93±2.93^{b}	58.72±1.30^{a}	58.53±3.30^{a}	66.66±0.41^{bc}	66.13±0.35^{c}	58.13±2.60^{a}	63.78±0.40^{a}

* Means with different superscripts in each raw are different at level p < 0.05.

The effect of olive cake meal ,sugar beet pulp and dried brewer's grain supplementation in rabbit diets on caecum activity (PH, ammonia and total volatile fatty acids), were showed in Table 7. A significant effect on caecum pH, ammonia and total volatile fatty acids. The pH value in the present study ranged from 5.26 to 6.0, the highest value was of 15% olive cake meal + enzyme.

From these results we found that all treated groups had a high pH value than control group. Also, treated groups showed significant differences in caecum ammonia and group that fed on 15% olive cake meal +enzyme showed highest value (12.60 mg/100ml) when compared to the control. Total volatile fatty acids in general were decreased when compared to the control the minimum value (3.26 ml equi/100 ml) was shown by rabbits fed on 15% sugar beet pulp while the maximum value (4.16 ml equi/100ml) was shown by control group without any supplementation. PH values of

rabbit caecum was ranged between 5.28 and 6.51 *(20)*. Also, ammonia level ranged 10.6 and 12.86 mg / 100 ml. while, total volatile fatty acids ranged between 2.98 ml equi / 100 ml and 4.15 ml equi / 100 ml. Total volatile fatty acids and PH for rabbits fed on diets supplemented with sugar beet pulp were reported as 48.6mmol and 5.63 *(21)*.

Table 7. Effect of diets containing olive cake, beet pulp or brewer's grain with or without enzyme on cecum activity of growing New Zealand White rabbit

Item	Experimental diets						
	Control	Olive cake 15 %		Sugar beet pulp 15%		Brewer's grain 15%	
		-ve kemzyme	+ve kemzyme	-ve kemzyme	+ve kemzyme	-ve kemzyme	+ve kemzyme
PH	5.26±0.014^{c}	5.75±0.028^{b}	6.0±0.63^{a}	5.64±0.060^{b}	5.72±0.040^{b}	5.60±0.098^{b}	5.75±0.041^{b}
Ammonia (mg / 100ml)	11.66±3.26^{a}	12.13±1.23^{a}	12.60±.2.8^{a}	11.66±1.68^{a}	12.13±1.23^{a}	11.66±0.46^{a}	11.20±2.80^{a}
TVFA (ml equi/ 100ml)	4.16±0.016^{a}	3.65±0.050^{b}	3.65±0.086^{b}	3.26±0.11^{c}	3.45±0.10^{bc}	3.51±0.060^{b}	3.61±0.060^{b}

* Means with different superscripts in each raw are different at level $p < 0.05$

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الملخص العربى

تأثير إضافة تفل الزيتون وبنجر السكر والشعير المجفف الى علائق الأرانب على معدلات التحويل ومعاملات الهضم والنشاط الأعورى

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أجريت هذه الدراسة بمزرعة الأرانب – قسم التغذية والتغذية الإكلينيكية بكلية الطب البيطرى – جامعة الزقازيق فى الفترة من أكتوبر حتى ديسمبر ٢٠٠٨ م .

استخدم عدد ٥٦ من الأرانب النيوزيلندى الابيض عمر ٣٥ يوم وتم توزيع الأرانب عشوائيا إلى سبع مجاميع متساوية بكل مجموعة ثمانية أرانب واستخدمت سبع علائق تجريبية متقاربة فى القيم الغذائية وتحتوى على مواد العلف الغير تقليدية (تفل الزيتون، تفل بنجر السكر ، تفل الشعير المجفف) مع إضافة إنزيم (كيم – زيم) لبعض العلائق. المجموعة الأولى هى المجموعة الضابطة وتتغذى على العلائق الطبيعية ، المجموعة الثانية وتغذت على ١٥% تفل زيتون كأحلال جزئى للردة والدريس ، المجموعة الثالثة وتغذيت على ١٥% تفل زيتون مع إضافة انزيم كيم – زيم ، المجموعة الرابعة وتغذيت على ١٥% تفل بنجر السكر والمجموعة الخامسة وتغذيت على ١٥% تفل بنجر السكر مع إضافة الانزيم ، المجموعة السادسة وتغذيت على ١٥% تفل الشعير المجفف والمجموعة السابعة و تغذيت على ١٥% تفل الشعير المجفف مع إضافة الأنزيم . تم تقديم العلائق التجريبية للأرانب لمستوى الشبع.

أوضحت النتائج أن هناك تأثير معنوى على وزن الجسم و معدل التحويل الغذائى وكذلك معاملات الهضم وايضا النشاط الأعورى . سجلت المجموعة التى غذيت على تفل الزيتون مع إضافة الانزيم أفضل قيم وذلك لوزن الجسم ومعدل استهلاك العلف ومعدل التحويل الغذائى على التوالى (٢٥٣٧,١ ، ١١١,٢١ جم ، ٣,٠٩%). أيضا سجلت نفس المجموعة أفضل النتائج لمعامل الهضم للمادة الجافة والبروتين(٦٨,٧٤،٧٣,٢%) وكذلك المجموعة التى غذيت على ١٥% تفل الشعير المجفف للمادة العضوية و المجموعة التى غذيت على ١٥% تفل الشعير المجفف مع إضافة الانزيم للألياف (٧٠,٤١، ٤٧,٦٣ %) على الترتيب.