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Reflection of feeding rations containing different levels of biological treated corn stalks on blood parameters and caecum microbial count for growing rabbits

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Abstract : This work aimed to investigate the effect of feeding fungal treated corn stalks with *Trichoderma ressei* on some blood parameters and caecum microbial count for rabbits. Forty-two weaned New Zealand white rabbits, six weeks ofage, were equally divided into 7 experimental groups (Each group divided into three replicates of two rabbits in each). The first group was fed on the control diet, the other six groups were fed diets containing corn stalks which replaced clover hay at33, 66 and 100% biologically treated with *Trichoderma ressei* or treated with media only (without *T.ressei*), the experimental lasted for 13 weeks. At the end of the experiment, the rabbits were slaughtered and blood samples were collected in heparinized tubes for biochemical analysis. Caecal total bacteria, fungi, actinomyces and cellulolytic bacteria microbial counts were estimated. Values of total protein, albumin, AST, ALT, creatinine, urea, cholesterol and triglyceride contents were within the normal range. Rabbits fed treated stalks with *T. ressei* recorded ($P\leq0.05$)lower values of total protein content than those fed without *T. ressei*, while no significant differences were recorded between treatments on the other blood parameters. The results indicated that the interaction was significant ($P\leq0.05$) at level of 33%, whereas total protein was decreased with *T. ressei*. Also, calcium, catalase (CAT) and lipid peroxidase (LPO) were ($P\leq0.05$) decreased with *T. ressei*in levels of 100, 66 and 100%, respectively. While ALT was significant increased for rabbits fed treated corn stalks with *T. ressei* at level of 33%. Results indicated that rabbits fed fungal treated corn stalks showed ($P\leq0.05$) higher total bacteria, fungi, actinomyces and cellulolytic bacteria counts than those fed stalks without *T. ressei*. And the level of 100% recorded the highest values of microorganisms count, but level of 66% recorded the highest value of cellulolytic bacteria. The results shown that the interaction was ($P\leq0.05$) with fungal treated stalks at levels 66 and 100%. It could be concluded that can be used biological treated corn stalks with *T. ressei*in feeding growing rabbi.

Key words : Biological treatment, corn stalks, blood parameters, caecum microbial count and rabbits.

Introduction

In the developing countries, as well as in Egypt, animals suffer from shortages of feed and are continuously increasing in cost. However, many million tons of agricultural residues are produced every year from field and processing of fruits and vegetables. In Egypt, there are about 25 million tons of plants by–products produced annually; wheat straw, rice straw and corn stalks consists the great amounts[1]. Such roughages are usually high in lignocelluloses and low in available energy and also are generally low in readily available carbohydrates as well as nitrogen and certain minerals. Their utilization is also limited by the low voluntary intake by theanimals and by their high cost for transport, being bulky[2].

Owing to the world feed shortage a great deal of research work was direct not only to make full use of the roughages, but also to increase are their feeding value. Intake and utilization of low quality roughages could be increased by proper supplementation or by various pretreatments. Such methods may involve physical, chemical and biological treatments and improve digestibility and nutritive values[3,4]. Among these methods, biological treatments were shown to be the most effective[5,6]. In addition to the scientific point stated above, it could be mentioned safely that rabbit production can contribute to solve the problem of meat shortage in most developing countries as well as in Egypt. Since, rabbits have rapid growth rate, high fertility rate , short gestation period, short generation intervals, high feed efficiency, early marketing age, and high muscle bone ratio, also, meat of rabbits has high protein content, low cholesterol and total lipids content[7].

The objective of the present study was to investigate the effect of feeding biological treated corn stalks with *Trichoderma reesei* or without *T.ressei* (treated with media only) at different levels on some blood parameters and caecum microbial count for growing rabbits.

Materials and Methods

Microorganisms and biological treatment for corn stalks:

Three days old slants cultures of *Trichoderma ressei* was crushed into flasks containing 20 ml of sterilized water. The fungi spores suspension was used as inoculant at 10 % V/W to inoculate 500 ml capacity flasks containing 25 g of ground corn stalks moistened at solid: liquid ratio of 1:2 with basal medium composed (g/ L); 40 sugarcane molasses, 2 urea, 0.2 potassium dihydrogen phosphate and 0.3 magnesium sulfate, the inoculated flasks were incubated at 30 ^{o}C for 72 hrs under static solid-state fermentation system. The prepared inoculate was used to inoculate 500 g of moistened stalks by the above basal medium at solid: liquid (1:2) at 10 % V/W and packed in polyethylene bags (50x100 cm). The inoculated bags were incubated at room temperature (30 ± 2 °C)for 10 days.

The 160 kg of chopped cornstalks wasequally divided into two heaps. The first heap was moistened with medium contained; 2.5% molasses, 2.5% urea, 1.5% ammonium sulphate, 1.00% supper phosphate and 0.5% magnesium sulphate at solid: liquid (1:2), mixed well and spread on plastic sheet without *Trichoderma reesei*. And the second heap wasmoistened with the above medium and inoculated with the previous prepared *T.reesei* inoculant at 10%, mixed well and spread on plastic sheet. The two heaps were shuffled upside down daily for the proper treatment period (14 day).At the end of treatment period, the treated stalks was collected and exposed to sun- dry until the moisture content reached less than 10%, then packed and storeduntil used in manufacturing the pelleted diets.

Experimental diets:

The air dried treated corn stalks without and with *Trichoderma reesei* used to formulate the experimental pelleted diets by substituting of clover hay at the levels of (0, 33 and 66 and 100%).Seven diets were formulated to be iso-nitrogenous and iso-caloric, and to meet the nutrients requirements of growing rabbits according torecommendation of[8] as show in Table (1).

Experimental animals and Feeding trials:

A total number of 42 weaned New-Zealand white rabbits, 6 weeks of age and weighted 500 g ±90 g were randomly divided into 7 experimental groups (6 rabbits in each), each group divided into three replicates.

The animal groups were fed on the pervious diets for 13 weeks (91 days). All animals were kept under the same managerial and hygienic conditions and housed in metal battery cages (two rabbits in each). Diets and water were offered *ad-libitum*.At the end ofexperimental period, the rabbits were slaughtered and blood samples were collected in heparinized tubes for biochemical analysis. Caecum samples were taken to determine caecal microbial counts

Table (1):The experimental diets formulation.

Ingredients	Experimental diets						
	Control	Without *Trichoderma ressei*			With *Trichoderma ressei*		
	0%	33%	66%	100%	33%	66%	100%
Clovr hay	33.00	22.00	11.00	-	22.00	11.00	-
Yellow corn	15.75	31.00	93.35	38.75	31.00	93.35	38.75
Barley	14.50	2.00	1.50	1.50	2.00	1.50	1.50
Soybean meal	17.40	19.65	21.65	21.65	19.65	18.00	17.0
Wheat bran	16.50	11.00	0.60	0.60	11.00	4.25	5.25
Corn stalks	-	11.00	22.00	33.00	11.00	22.00	33.00
Calcium Di-phos.	2.05	2.40	2.85	3.05	2.40	2.85	3.05
Lime stone	0.10	0.20	0.25	0.60	0.20	0.25	0.60
NaCl	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Premix *	0.30	0.30	0.30	0.30	0.30	0.30	0.30
L.Meth.	0.04	0.05	0.10	0.15	0.05	0.10	0.15
*Calculated***							
DE	2513	2503	2895	2412	2518	2501	2425
Ca	1.08	1.04	1.01	1.03	0.970	0.92	0.96
T.ph	0.80	0.80	0.79	0.80	0.82	0.79	0.83
Lysine	0.89	0.85	0.80	0.74	0.85	0.71	0.63
Meth.	0.55	0.57	0.57	0.58	0.56	0.46	0.54
Sodium	0.20	0.19	0.18	0.17	0.17	0.18	0.17

**Each kg of Vitamine and Minerals mixture contains; Vit.A 2.000 IU, Vit. B_1 0.33g, Vit B_2 1.09; Vit B_3 150.00 IU , Vit E 8.33 g , Vit K 0.33 g, pantothemic acid, 3.33 g; Nicatonic acid 30.g; Vit B_6 2.00 g; Vit. B_{12} 1.7 mg, Folic acid 0.039, Biotin 33 mg. Cu 0.50 g cholin chloride 200 mg, Mn 5.0 g; Fe 12.5 g, Mg 66.7 mg; Co 1.33 mg; Se 16.6 mg; Zn 11.9; Iodine 16.6 mg and Antioxidant 10.0 g.*

*** according to [8].*

Analytical methods:

Mycotoxin detection:

Thin layer chromatography was applied according the method that described by [9] for detection mycotoxin in treated corn stalks.

Blood samples collection and analysis:

At 13 weeks of age, three rabbits from each treatment were randomly taken, individual blood samples from sacrificed rabbits were collected in heparinizedtubes. Then blood was transferred immediately into dry clean centrifuge tubes and centrifuged at 3000 r.p.m for 15 minutes, the plasma was transferred and stored in deep freezer (-20ºC) for the subsequent biochemical analysis assays. Total protein was measured using Buiret method as described by [10]. Albumin determined according to[11]. Globulin calculated by difference between total protein and globulin. Cholesterol and triglycerides determined according to[12]. Aspartic transeaminase (AST) and Alaminetranseaminase (ALT) were assayed by method of[13]. Urea was measured according to[14].Creatinine was determined according to[15]. Alkaline phosphatase determined according to[16].Calcium was determined according to[17]. Inorganic phosphorus measured according to[18]. Lipid Peroxidase (LPO) determined according to[19]. Total antioxidative capacity (TAC)was performed by the reaction of antioxidants in the samples with a defined amount of exogenously provide hydrogen peroxide according to[20]. Catalase (CAT) was estimate according to[21].

Total counts of bacteria, fungi, actinomyces and cellulolytic bacteria in caecum:

Three caecal of rabbits per treatment were separated carefully used to estimate the caecal microbial count. The serial dilution plate count procedure was used to estimate the total number of different groups of micro-organisms; bacteria; fungi and actinomyces. Three selective media were used for plate count; nutrient agar [22], Martin's medium [23] for fungi account and glucose asparagine agar for actinomyces account. Plates were incubated at 28 °C for mesophilic. Fungal colonies were counted after 3 days, while bacteria and actinomyces colonies after 10 days and colonies of actinomyces have been distinguished by their characteristic growth, and by the use of straight needle and microscopic examination, counts were presented per one g oven dry weight of material.Five dilution tubes containing the different selective media were inoculated with 1.0 ml from each dilution. The most probable numbers of bacteria were obtained from the positive tubes using methodof[24]. Dubos's cellulose medium was used todetermine aerobic cellulose-decomposing organisms, in the positive tubes, the filter paper showed a yellowish brown colour and gradually lost its con chancy.Each of the following carbon sources was added to glucose asparagine medium instead of glucose for testing the efficiency of the isolates to utilize those carbon sources; glucose, xylose, arabinose, rhamliose, mannose, galactose, fractose, sucrose, lactose, raffinose, marvutol, inositol and salicil at the rate of 1 %. Agar plates were streaked and incubated for 4 days at 28 °C for mesophilic.

Statistical analysis:

The collected data were subjected to statistical analysis as two factors factorial analysis of variance using the general linear model procedure of[25]according to the following model:

$$Y_{ijk}=\mu + T_i + L_j + (TL)_{ij} + e_{ijk}$$

Where; Y_{ijk}: observation, μ: the overall mean, Ti: effect of treatment, L_j: effect of level, TL_{ij}: the interaction between treatments and levels, e_{ijk}: the experimental error. And Duncan's Multiple Range Test[26]was used to separate means when the differences were significant.

Results and Discussion

Blood Constituents:

Table (2) show values of total protein, albumin, AST, ALT, creatinine, urea, cholesterol and triglyceride contents found to be within the normal range of plasma blood analysis of rabbits according to[27],who mentioned that the normal ranges of rabbits blood total protein, albumin, albumin/globulin ratio, creatinine, AST, ALT, urea-N, calcium, phosphorus, cholesterol and triglyceride were 6.45±0.31 g/dl, 2.73±0.30 g/dl, 0.58, 0.8-2.57 mg/dl, 47 U/l, 79 U/l, 14.3±3.0 mg/dl, 10 ±2.24 mg/dl, 4.16 ± 0.46 mg/dl, 26.7± 15.9 mg/dl and 122 mg/dl. Statistical analysis showed significant differences (P≤0.05) only in total protein between treatments. Rabbits fed treated corn stalks with *T. ressei* recorded lower values (P≤0.05) of total protein concentration (5.39) than those fed stalks without *T. ressei*(6.06 g/dl) groups, while, no significant differences were observed between treatments on the other blood parameters.In this respect,[28]reported thatblood constituents for rabbits fed fungal treated sugar beet pulp (SBP) included; total protein, albumin, urea, creatinine, AST and ALT were within the normal range according to[27]. However, rabbits fed untreated SBP recorded lower albumin and urea values than the other groups, but values of urea and ALT were higher for animals fed fungal treated SBP than the other groups. [29]found that when treated wheat straw with *T. viride* replaced 25, 50 and 75% of CFM, blood total protein of growing lambs deceased by 18.0, 12.8 and 18.4%, albumin by 10.5, 7.9 and 10.0%, respectively. However, [30] indicated that using biologically treated wheat straw with *T. reesei i*n sheep rations at level 25 and 40% had no significant effect on blood total protein and globulin. While, [31]observed that rabbits fed non-treated apple pomaceand biologically treated apple pomace at level of 26 or 50% had insignificant differences in blood albumen, globulin concentration and A/G- ratio. Also, [32]found no change in total protein when enzymes were added (Bentonite Co supplementation) to rabbit diets. Feeding growing rabbit on biologically treated corn stalks had insignificant differences in AST, ALT and alkaline phosphatase, compared to the control group. The same trend in activities of AST, ALT and alkaline phosphatase was reported by [29] and [30]who fed lambs on biologically treated wheat straw with *T. viride*. Results in Table (2) showed that rabbits fed biologically treated corn stalks insignificantly lower in blood urea and creatinine compared with control group. Similar results obtained by [29]and [30]when fed lambs biologically treated wheat straw. In this respect, [33]when add 0.5% of dried yeast to rabbit rations, who found no significant effect on blood creatinine concentration compared to the control diets. Theprevious results were in agreement with [32] who found that addition enzyme (Bentonite Co supplementation) to rabbit rations decreased serum urea concentration. Biologically treated corn stalks with *T. reesei* in rabbits diets had no significant effect on blood cholesterol and triglyceride, compared to the untreated corn stalks group. These results were found to be in disagreement with [32] who found that addition enzyme (Bentonite Co supplementation) to rabbit rations decreased cholesterol concentrations. The interaction between treatments and levels shown in Table (3). The results indicated that the interaction was significant ($P \leq 0.05$) in level 33%, whereas total protein was decreased with *T. ressei*. Also, calcium, catalase (CAT) and lipid peroxidase (LPO) were ($P \leq 0.05$) decreased with *T. resseiin* levels of 100, 66 and 100%, respectively. While ALT was significant increased for rabbits fed treated corn stalks with *T. ressei* at level of 33%.

Table (2): Effect of treatments and levels of corn stalks on blood parameters for experimental groups.

Item	Treatments		SEM	Levels				SEM
	Without *T. reesei*	**With *T. reesei***		**0%**	**33%**	**66%**	**100%**	
Total protein, g/dl	6.06^{a}	5.39^{b}	0.19	6.43^{a}	5.12^{b}	5.77^{ab}	5.58^{b}	0.19
Albumin, g/dl	3.67	3.58	0.13	3.94	3.54	3.27	3.77	0.13
Globulin, g/dl	2.39	1.81	0.06	2.49	1.58	2.50	1.81	0.06
A/ G ratio	1.54	1.98	0.03	1.58	2.24	1.31	2.08	0.03
Creatine, mg/ dl	0.46	0.29	0.06	0.29	0.45	0.53	0.23	0.06
AST, U/L	27.30	27.65	3.09	38.96	23.31	24.60	23.04	3.09
ALT, U/L	59.49	56.49	3.12	53.90	53.61	56.54	67.91	3.12
Urea, mg/ dl	36.25	34.75	1.19	29.67^{c}	37.17^{ab}	40.17^{a}	35.00^{c}	1.19
Alkaline phosphatase, UL	622.3	575.3	39.46	363.3^{b}	688.7^{a}	659.0^{a}	684.0^{a}	39.46
Calcium, mg/ dl	14.92	14.50	0.21	15.33^{a}	14.83^{a}	15.17^{a}	13.50^{b}	0.21
Phosphorous, mg/ dl	6.25	6.42	0.22	5.33^{c}	6.33^{b}	7.67^{a}	6.00^{bc}	0.22
Cholesterol, mg/ dl	27.92	30.83	2.27	33.33^{a}	21.17^{b}	28.83^{ab}	34.17^{a}	2.27
Triglyceride, mg/ dl	46.42	48.17	4.13	34.67^{b}	49.50^{ab}	52.67^{a}	52.33^{ab}	4.13
CAT, U/L	191.9	143.7	16.75	128.4^{b}	243.1^{a}	146.8^{b}	152.9^{b}	16.75
TAC, nmol/L	0.26	0.25	0.08	0.28^{a}	0.23^{ab}	0.27^{ab}	0.23^{b}	0.08
LPO,nmol/ml	6.58	4.17	0.52	5.67	4.50	5.50	5.83	0.52

a, b and c: Means of treatments and levels having different superscripts significantly differ (P<0.05).
SEM :Standard error of the mean.

Table (3): The interaction between treatments and levels of corn stalks on blood parameters for experimental groups.

Item	**Experimental diets**							SEM
		Without *T. reesei*			**With *T. reesei***			
	0%	**33%**	**66%**	**100%**	**33%**	**66%**	**100%**	
Total protein, g/dl	6.43^{a}	6.29^{a}	5.69^{b}	5.81^{b}	5.95^{b}	5.85^{b}	5.34^{b}	0.19
Albumin, g/dl	3.94	3.35	3.36	4.04	3.13	3.17	3.49	0.13
Globulin, g/dl	2.49	2.94	2.33	1.77	2.82	2.68	1.85	0.06
A/ G ratio	1.58	1.14	1.44	2.28	0.90	1.18	1.89	0.03
Creatine, mg/ dl	0.29^{ab}	0.67^{a}	0.45^{ab}	0.44^{ab}	0.24^{ab}	0.61^{a}	0.02^{b}	0.06
AST, U/L	38.96	20.33	22.97	26.95	26.29	26.23	19.12	3.09
ALT, U/L	53.90^{bc}	41.44^{c}	59.73^{bc}	82.88^{a}	65.77^{ab}	53.35^{bc}	52.95^{bc}	3.12
Urea, mg/ dl	29.67^{c}	42.33^{a}	37.67^{ab}	35.33^{bc}	32.00^{bc}	42.67^{a}	34.67^{bc}	1.19
Alkaline phosphatase, UL	363.3^{b}	651.0^{a}	736.5^{a}	738.3^{a}	726.5^{a}	581.5^{ab}	629.8^{b}	39.46
Calcium, mg/ dl	15.33^{a}	14.67^{a}	15.33^{a}	14.33^{a}	15.00^{a}	15.00^{a}	12.67^{b}	0.21
Phosphorous, mg/ dl	5.33^{c}	6.67^{b}	7.00^{b}	6.00^{bc}	6.00^{bc}	8.33^{a}	6.00^{bc}	0.22
Cholesterol, mg/ dl	33.33^{abc}	19.00^{d}	17.67^{d}	41.67^{a}	23.33^{cd}	40.00^{ab}	26.67^{bcd}	2.27
Triglyceride, mg/ dl	34.67^{cd}	31.00^{d}	47.33^{bcd}	72.67^{a}	68.00^{ab}	58.00^{abc}	32.00^{d}	4.13
CAT, U/L	128.4^{bc}	266.1^{a}	220.2^{ab}	152.9^{abc}	220.2^{ab}	73.39^{c}	152.9^{abc}	16.75
TAC, nmol/ L	0.28^{a}	0.26^{ab}	0.26^{ab}	0.23^{ab}	0.21^{b}	0.27^{ab}	0.23^{ab}	0.08
LPO,nmol/ml	5.67^{b}	6.00^{b}	5.33^{bc}	9.33^{a}	3.00^{bc}	5.67^{b}	2.33^{c}	0.52

a, b, c and d: Means of treatments and levels having different superscripts significantly differ (P<0.05).
SEM :Standard error of the mean.

Cecum microbial counts:

The results of the total bacteria, fungi, actinomyces and cellulolytic bacteria are shown in Table (4). The recorded values were 56.3, 7.3, 5.5 and 30.0 with for without *T. reesei*and 58.8, 10.7, 7.4 and 30.8 for with*T. reesei*, respectively. The rabbits fed fungal treated corn stalks showed significantly (P≤0.05) higher total bacteria, fungi, actinomyces and cellulolytic bacteria counts than group fed corn stalks without *T. reesei*. The results revealed that feeding rabbits at 100% regardless of treatment showed the highest (P≤0.05) value of bacteria, fungi and actinomyces count compared with the other levels, while the highest value of cellulolytic bacteriawas recorded with level of 66%. In general, total bacteria, fungi, actinomyces and cellulolytic bacteria count increased as the level of corn stalks increased in rabbits diets regardless of treatment. Increasing bacteria count and cellulolytic concentration attributed to the higher crude fiber digestibility compared to the control group. On the other hand, biological treatments are alternative treatments to modify digestion of fibrous materials by ruminants. The mode of fungal action on roughages by white rot fungi was found to improve in-vitro dry matter digestibility of the decoyed substrate [34]. So rabbitscan convert dietary by-products to meat and skin due to their high feeding efficiency, because it have a large cecum that containing varied species of microorganisms and arecetophage[35].

Table (5) shown the interaction between treatments and levels, the results indicated that biological treated corn stalks with *T. reesei* was significant (P≤0.05) increased total bacteria, fungi, actinomyces and cellulolytic bacteria counts, especially at levels of 66 and 100%.

Table (4): Effect of treatments and levels of corn stalks on cecum microbial counts.

Item	Treatments		SEM	Levels				SEM
	Without *T. reesei*	With *T. reesei*		0%	33%	66%	100%	
Bacteria, 10^5	56.3^{b}	58.8^{a}	2.10	40.3_{b}	62.9^{a}	62.9^{a}	64.0^{a}	2.10
Fungi, 10^3	7.3^{b}	10.7^{a}	0.58	5.9^{c}	9.3^{b}	10.3^{a}	10.5^{a}	0.58
Actinomyces,10^3	5.5^{b}	7.4^{a}	0.35	4.7^{c}	6.2^{b}	7.1^{ab}	7.7a	0.35
Cellulolytic bacteria, 10^3	30.0^{b}	30.8^{a}	0.62	25.4^{c}	32.1^{a}	32.5^{a}	31.6^{b}	0.62

a, b and c: Means of treatments and levels having different superscripts significantly differ (P<0.05).
SEM :Standard error of the mean.

Table (5): The interaction between treatments and levels of corn stalks on cecum microbial counts.

Item	Experimental diets							SEM
		Without *T. reesei*			With *T. reesei*			
	0%	33%	66%	100%	33%	66%	100%	
Bacteria, 10^5	40.3^{c}	61.1^{b}	61.3^{b}	62.6^{b}	40.3^{c}	64.8^{a}	64.5^{a}	2.10
Fungi, 10^3	5.9^{e}	$7.0d^{e}$	7.7^{cd}	8.6^{c}	5.9^{e}	11.6^{b}	12.9^{a}	0.58
Actinomyces, 10^3	4.7^{e}	5.0^{e}	5.7^{de}	6.6^{cd}	4.7^{e}	7.4^{bc}	8.5^{ab}	0.35
Cellulolytic bacteria, 10^3	25.4^{d}	31.5^{bc}	31.9^{bc}	31.2^{c}	25.4^{d}	32.7^{a}	33.1^{a}	0.62

a, b, c, d and e :Means in the same row having different superscripts significantly differ (P<0.05).
SEM :Standard error of the mean

Similar results have been obtained by[36] when studied effect of partial and completely replacement of clover hay by fungal treated corn stalks in growing rabbit diets,found that total bacteria countwas significantly (P≤0.05) higher for rabbit fed 35% treated rice straw than control group. And the cellulolytic bacteria count increased in rabbits fed diet contained 35% treated rice straw with bacteria plus fungi compared with groups fed control diet. These results are in agreement with those of[37] found that colonization of the cecum with organisms favorable for cellulose digestion requires large number of bacteria and found that *cellulomonace* bacteria increased with increasing cellulose in the diet.

Conclusion

From the previous results it could be concluded that it can be used biological treated corn stalks with *T. reesei* in growing rabbits feeding.

References

1. Ministry of Agric. and Land Reclamation (2008).Part 1.Published by Agric. Res. Center, Egypt.Ministry of Agriculture, Egypt.
2. Abedo, A.A. (2011). Prospects of Recycling Field Crop Residues in Animal Feeding Strategy. Review Article. pp: 7-8. Animal Production Department, National Research Center. Dokki, Giza, Egypt.
3. Rangnekar,D.V., Badve,V.C., Kharat,S.T., Sobole, B.N. and Joshi, A.L.(1982) . Effect of high pressure steam treatment on chemical composition and *invitro* digestibility of roughages. Anim. Feed Sci.Technol., 7: 61-70.
4. Cheeke, P.R.(1987). Rabbit Feeding and Nutrition. Academic press, INC. Orlando, Florida, USA.pp: 376
5. Singh, K. (1991). Biodegradation of macro-molecules of feeds for livestock.First International Animal Nutrition Workers Conference for Asia andPacific. September 23-28,Bangalore (India). Compendium .pp: 92-99.
6. Rangaswami, G. and Bagyaraj D.J.(1996). Agricultural Microbiology. Second Edition. Prentice-Hall of India. NewDelh,India.
7. Hernandez, P.; Pla M.; Oliver, M.A. and Blasco, A. (2000). Relationship between meat quality measurements in rabbits fed with three diets of different fat type and content. Meat Sci., 55: 379-384.
8. NRC (1977).National Research Council.Nutrient requirements of rabbits. National Academy of Sciences ,Washington, DC., USA.
9. Fadel, M.; .Amara H; Murad H. A. and El-Shinnawy H. K. (1992).Production of fungal protein from wheat straw by *Penicillium funculosium*. Egyptian J. Food Science, 20:1.
10. Gormall,A.G; Bardawill, C.J. and David, M. M.(1949). Determination of serum proteins by means of the biuret reaction. J. Biological Chemistry. 177:751-759.
11. Doumas, B.T. (1971). Clin.Chim.Acta, 31: 87.
12. Richmond, W.(1973).Preparation and properties of a cholesterol oxidase from *nocardiasp*. and its application to the enzymatic assay of total cholesterol in serum.Division of Clinical Chemistry, Medical Research Council, Clinical Research Centre, Harrow, Middlesex, England.*Clinical Chemistry*, 19, 12: 1350-1356.
13. Reitman, S. and Frankel,S. (1957). Calorimetric determination of pt Activity according to the Reitman and Frankel Method. Am. J. Clim. Path.28-56.
14. Fawcette, J. and Scott,E.(1960).Determination of urea j.Clinical Pathology,13:156-160.
15. Bartels, H. and Bohmer (1972). Estimation of creatinine clearence in patients with unstable renal function.Clin.Chim.Acta, 37:173.
16. Belfield, A. and Goldberg, D.M. (1971). Enzyme, 12: 561.
17. Gindler,M. and King, J.D. (1972). Am. J. Clin. Path., 58: 376.
18. El-Merzabani, M.M., El-Aase, A.A. and Zakhary, N.I. (1977). J. Clin. Chem. Clin. Biochem., 15: 715-718.
19. Ohkawa, H., Ohishi, W. and Yagi, K. (1979). Anal.Biochem., 95: 351.
20. Koracevic, D. and Koracevic, G. (2001). J. Clin. Pathol., 54: 356-361.
21. Aebi, H. (1984). Methods Enzymol. 105: 121-126.
22. Difco (1966). DifcoManual of Dehydrated Culture Media and Ragents of Microbiological and Clinical Laboratory Procedures 10^{th} Ed Difco Lab. Detroit, L, Michigan. USA.
23. Allen, O.M. (1953). Experiments in Soil Bacteriology. Ins. Burgess publ., USA.
24. Hoskins, J.K. (1934). The most probable numbers for evaluation of coliaerogenes tests by fermentation tube method.Public Health Reports Washington, 49: 393.
25. SPSS (1998). Statistical Package for Social Siemens.
26. Duncan, D.B. (1955). Multiple rangeand multiple F test. Biometrics, 11: 1.
27. Kaneko, J. J. (1989). Clinical Biochemistry of Domestic Animals.4^{th} edition.Academic press, Inc.
28. El-Badawi, A. Y.; Hassan, A. A. and Abedo, A. A. (2007). Growth performance of New-Zealand white rabbits fed diets containing different levels of untreated or fungal treated sugar beet pulp. The 58^{th} EAAP Meeting, August 26-29, 2007. Dublin, Ireland.
29. Abou-Ammou, F.F.; Abdel-Khalek, T.M.M.; Mahrous, A.A. and El-Shafie, M.H. (2008). Effect of feeding rations containing graded levels of biologically treated wheat straw on carcass characteristics and some blood parameters of growing lambs. Egyptian. J. Nutrition and Feeds, 11,3: 469-479.

30. Al-Asfour, O.N. (2009).Effect of biological treatment on nutritive value of some agricultural by-Products. M.Sc. Thesis, Fac. Agric., Ain Shams Univ., Egypt.
31. Zaza, G.H.M. (2005). Effect of incorporation of biologically treated sugar beet pulp as non-conventional feedstuffs in the diets of growing rabbits. The 4th Inter. Con. on Rabbits Prod. In hot climates.Sharm El-Sheikh, Egypt.
32. Abdel-Rahman, M. A.; Sawiress, F. A. R., Sohair, Y. S. (2010): Effect of kemzymebentonite. co-supplementation on cecalfermentation and metabolic pattern in rabbit. J. ofAgric. Sci., 3, 2: 183- I 87
33. Omer,H.A.A.; Hewida,M.H.E; Laila,D.A. and Nagwa,M. (2010). Productive performance of rabbits fed diets containing lemongrass or active dried yeast. American-Environmental Science, 7, 2:179-187.
34. Dawson, K. A.; Newman, K. E. and Boling, J. A. (1990). Effects of microbial supplements containing yeast and lactobacilli on roughage fed animal microbial activities. J. Anim. Sci. 68: 3392.
35. Spreadbury, D. (1978).A study of the protein and amino acids requirements of the growing New Zealand white rabbit with emphasis on lysine and the sulphur containing amino acids.*Brit. J.Nutri.*,39:601.
36. Abd El-Hakim, A.S.; Shakweer, I.M.E. and Azoz, A.A. (2006). Effect of using different levels of biologically treated rice straw in growing rabbits diets on growth performance, nutrients digestibility and some physiologies parameters. Egypt. J. of Rabbit Science 16 (2): 191-209.
37. lelkes, L. (1987). A review of rabbit enteric disease: a new prespective. J. of Applied Rabbit Research. 1987, 10: 2, 55-61.

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