Efficacy Of Boldenone Undecylenate And Probiotic As Growth Promotors On Male Buffalo Calves

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ABSTRACT

This study was planned to investigate the effect of probiotic and Boldenone undecylenate on body weight gain, feed conversion rate, blood picture and some biochemical alterations of male buffalo calves. This study was done on twenty male healthy buffalo calves 7-8 months old and weight ranges from 164-170 Kg. They were divided into 4 equal groups each of 5 calves, 1st group healthy buffalo calves (control), 2nd group healthy buffalo calves treated with probiotic (Biogen), 3rd group, healthy buffalo calves treated with half therapeutic dose of Boldenone undecylenate and 4th group healthy buffalo calves treated with the therapeutic dose of Boldenone undecylenate. Two blood samples were collected at 1st, 2nd, 3rd, 4th and 5th injection at 4 weeks and 4 weeks post last injection. 1st Sample used for hematological studies. 2nd sample used for biochemical analysis.

Oral dosing of probiotic and I/M injection of full dose of boldenone undecylenate induced a significant increase in weight gain, erythrocytic count, hemoglobin% content, packed cell volume %, total leukocytic count, total proteins, , globulin, calcium and phosphorus and significant decrease in feed conversion rate beside insignificant effect on albumin compared with control buffalo calves. Half therapeutic dose of boldenone undecylenate induce insignificant effect in all above parameters.

Probiotic and Boldenone undecylenate in therapeutic dose showed non significant effect on serum ALT, AST, ALP, urea and creatinine and significant decrease in blood glucose level.

It could be concluded that the Probiotic and boldenone undecylenate induce good improvement in body weight and feed conversion rate but boldenone undecylenate has some adverse effects on some biochemical parameters than probiotic, so probiotics can be used as safe growth promoter.

INTRODUCTION

Buffalo constitute one of the most important sources of meat and milk production in Egypt. Buffalo have a sort of resistance against infection compared with other domestic live-stock *(1)*.

Probiotics are defined as living microorganisms, which exert health benefits *(2)* are microbial dietary adjuvants that beneficially affect the hosts' physiology by modulating their mucosal and systemic immunity as well as improving the nutritional and microbial balance in their intestinal tracts. Probiotics are potentially useful in the management and treatment of various gastrointestinal diseases including diarrhea, inflammatory bowel disease, and colon cancer *(3)*. Probiotics are used in poultry management not only to enhance performance, but also to develop and stimulate the immune response *(4)*.

Boldenone undecylenate is considered a long-lasting anabolic steroid recommen-ded in treating debilitated animals, when an improvement in weight, hair coat, or general physical condition are desired. Its effect persists for up to 8 weeks *(5)*. Boldenone (1, 2-dehydrotestosterone) is a common veterinary

anabolic agent and its structure is very similar to testosterone *(6)*. This study was planned to study the effects of the probiotic and boldenone undecylenate on body weight gain, feed conversion rate, blood picture and some biochemical parameters of the buffalo calves.

MATERIAL AND METHODS

Drugs

1-Probiotic (Biogen)® It is composed of digestive enzymes (α- Amylase, β-Amylase, Protease), *Bacillus subtilis* nato (not less than $1*10^{11}$CFU) (Samu Median Co..Ltd.2012).

2-Boldenone undecylenate (Equigan)® injectable clear solution, produced by *Laboratorios Tornel. Co. Mexico*, available as vail 50- 100 ml, each ml contains 50 mg active principle.

Animals

Twenty male healthy buffalo calves of native breed, aged 7-8 month weighting 164–170 kg body weight from a pirated farm in Menia El Kamah City, Sharkia Province, Egypt; were used in this study.

Ration Table 1. Complete mixed ration Kg % (as fed)

Ingredients	Yellow corn	Wheat bran	Cotton seed meal	Soybean meal	Molasses	Calcium carbonate	Sodium chloride	Vitamin & micromineral
Percentage	60 %kg	10% kg	15% kg	11% kg	2% kg	1% kg	1% kg	0.2% kg

Wheat straw 1% kg /body weight / day. Berseem hay 1.5 % kg / body weight / day

Experimental design

Twenty male buffalo calves were divided into four equal groups (five each) 1st group (control group) 2ndgroup: calves treated with probiotic (Biogen 1Kg/ ton feed) 3rd group: Calves treated with half therapeutic dose of Boldenone undecylenate 1ml/ 90 Kg B.W and 4th group: calves treated with the therapeutic dose 1ml/45 Kg B.W.

Sampling

Two blood samples were collected from each calve of all groups by Jugular vein puncture before the use of drugs and at 1st, 2nd, 3rd, 4th and 5th injection every 4weeks and at 4weeks post last injection (6th) ;1stsample was taken in tube containing EDTA for estimation of blood picture. and 2nd sample was taken for obtaining clear serum for estimation of total protein*(9)* albumin *(10)*, globulin was calculated as difference between total proteins and albumin, transaminases AST–ALT*(11)* ALP*(12)* and serum urea was estimated *(13)*.

Statistical analysis

The obtained data were statistically analysed using students T test *(15)*.

RESULTS AND DISCUSSION

The present study aims to spot the light on the effect of the probiotic and boldenone undecylenate in buffalo calves with regard to its effect on body weight gain, feed conversion rate, some adverse effects of the probiotic and boldenone undecylenate on erythrogram, total leukocytic count, protein profile as well as liver and kidney functions.

Regarding the effect of probiotic on body weight gain in healthy buffalo calves, the obtained results revealed a significant increase in body weight and weight gain compared with control buffalo calves Table 2. This result is

supported with the result previously recorded *(17)* in dairy cattle and in Holstein calves *(16, 18)* and in lambs *(19)*. The increased body weight gain and reduction in feed conversion rate may be due to the Probiotic which improved the general health of animals through stimulating the appetite *(20)* and /or improvement of the intestinal balance which maintains the optimal condition of the beneficial microorganisms within the gastrointestinal tract *(21)*.

In our study, the healthy buffalo calves I/M injected with full therapeutic dose of boldenone undecylenate showed significant increase in weight gain and reduction in feed conversion rate whereas half therapeutic dose induced insignificant increase in body weight gain and reduction in feed conversion rate Table 2. Our results are similar to these recorded before in cattle calves *(6)*, in beef cattle *(20)* in goats *(21)* and in lambs *(22)*. Rise in weight gain post injection of boldenone undecylenate may be due to improvement in appetite *(23)* promoting the body tissue building processes by anabolic steroid boldenone increasing nitrogen retention, protein synthesis and decreasing muscle protein degradation *(24)*.

The obtained results revealed also that oral administration of probiotic to buffalo calves elicited a marked increase in erythrocytic count, hemoglobin content, packed cell volume % and a significant increase in total leukocytic count alonge the course of the experiment Table 3. Our results were compatible with that recorded in Friesian calves *(25)*, female goats *(23)* and in lambs *(17)*. Elevation in total erythrocytic counts may be due to stimulation of erythropoietin by stimulating erythropoeitic stimulating factor by increasing the release of erythropoietin from the kidneys. Erythropoeitin is a hormone known as EPO signals the body to increase the production of red blood cells *(27)*. Our results go hand in hand with those mentioned before *(28, 29)* which showed that probiotics induce significant increase in total leucocytic counts. These results coincide with those obtained in lambs received probiotic and showed a significant increase in total leukocytic count *(30)*.

In the present study, it has been shown that healthy buffalo calves I/M injected with full therapeutic dose of boldenone undecylenate displayed a significant increase in total erythrocytic count, haemoglobin % and paked cell volume % Table 4. Similar findings were recorded in rats *(31)* in kids *(22)* and in lambs *(23)*. Elevation of erythrocytic count could be attributed to boldenone undecylenate which stimulates erythropoietin hormone *(32)*. Leukocytosis induced in buffalo calves post boldenone undecylenate injection was recorded previously in horses *(33)*. The present work revealed that, buffalo calves supplemented with probiotic showed a significant increase ($p<0.001$) in total protein and globulin while showed non significant changes in albumin. Similar findings were reported *(34)*, in growing buffalo calves *(35)* and in lambs *(36)*. Elevation of proteins profile in our results may be attributed to improvement of the intestinal absorption of some nutrients which leads to increased protein levels *(37)*. Also, the elevation in protein induced by probiotic may be a response to proteolytic activities of bacillus species following probiotic which increase protein digestibility *(38)*.

The results of this study revealed that boldenone undecylenate in full therapeutic dose induce significant elevation in serum total protein, and globulin level in healthy buffalo calves, while showed non significant changes in serum albumin Table 5. Similar results were recorded in lambs *(23)* and in rabbits *(39)*. Boldenone undecylenate induced a significant increase in protein profile as a result of increased nitrogen retention, protein synthesis in liver, increased appetite and decreased protein catabolism *(6, 40)*.

The obtained data revealed that, buffalo calves supplemented with probiotic showed non significant changes in serum ALT, AST and ALP levels when compared with control group Table 6. Our results were in accordance with the results reported before in lamb *(41)*.

Boldenone undecylenate in half therapeutic dose produced insignificant increase in aminotransferase (AST and ALT) and alkaline phosphatase but full therapeutic dose of

boldenone undecylenate displayed a significant increase (P<0.001) in AST, ALT and alkaline phosphatase level in buffalo calves all over the experimental period compared to non treated calves. Similar results were previously obtained *(22)* whereas our results were not in agreement with those obtained *(42)* in lambs.

In this study it is clear that buffalo calves supplemented with the tested probiotic induced insignificant effect on urea and creatinine allover the experimental period when compared with healthy non treated buffalo calves. Same results were recorded in lambs *(17)*.

The obtained results showed that, intramuscular injection of boldenone undecylenate in therapeutic dose to buffalo calves induced changes in kidney function, represented by insignificant decrease in urea and significant increase in creatinine level allover the experimental period when compared with healthy non treated calves. These findings coincide with those obtained in dogs *(40)* and in goats *(43)*. The change in kidney caused by boldenone undecylenate might be due to rapid renal elimination of urea *(44)*.It has been also reported that boldenone undecylenate induces insignificant reduction in urea levels due to reduction of urea formation in liver as a sequence reduction of protein catabolism *(24)*.

Our results showed that, supplementation of buffalo calves with probiotic afforded a significant decrease in blood glucose level. These findings agreed with those obtained in lambs *(45), and* in rats *(46)*. Gluconeogenesis, in ruminants, is the main source of glucose *(50)*. The decrease in glucose level in calves supplemented with probiotics could be possibly attributed to lowered gluconeogenesis *(48, 49)*.

The glucose level of buffalo calves I/M injected with boldenone undecylenate revealed significant increase allover the experiential period. Our results are reinforced the study which recorded *(50)* found that boldenone undecylenate increases blood glucose level due to increased serum cortisol and decreased insulin receptors sensitivity. It has been found also that boldenone undecylenate showed significant increase in glucose *(51)*.

The present work revealed that there was a significant increase in serum calcium and phosphorus level in buffalo calves supplemented with probiotic. Same results were recorded in holestein cattle *(36)*. This elevation in calcium level may be due to increasd solubility of minerals by the Probiotic, because of increased bacterial production of short-chain fatty acids, which is promoted by the greater supply of substrate, an enlargement of the absorption surface by promoting proliferation of enterocytes mediated by bacterial fermentation products, predominantly lactate and butyrate, increased expression of calcium-binding proteins*(52)*.

Our study revealed that, boldenone undecylenate elicited a significant increase in calcium and phosphorus level of buffalo calves. Same results were recorded in goats *(22)* and lambs *(51)*. They were supported by the previous results *(53)* which demonstrated that boldenone undecylenate induced a significant elevation in calcium level due to retention of calcium in the body. Elevation of calcium and phosphorus may be due to decrease in the urinary excretion of calcium and phosphorus by anabolic steroids *(40)*.

It could be concluded that the Probiotic and boldenone undecylenate induced improvement in body weight and feed conversion rate but boldenone undecylenate has some adverse effects on some biochemical parameters than probiotic, so probiotics can be used as safe growth promoter.

Table 2. Effect of therapeutic dose of Biogen (1Kg/ton feed) and Equigan (1ml/45 Kg or 1ml/90Kg b.wt) on body weight gain and feed conversion rate in Buffalo calves (Mean + S.E.) (n= 5)

Groups		Parameters	Values Post treatment(4 weeks)					
			1st	2nd	3rd	4th	5th	6th
control		I.W. Kg	164± 4.39	183.6± 5.45	205.5± 6.23	205.5± 6.23	230± 6.03	290.3± 7.7
		F.W. Kg	183.6± 5.45	205.5± 6.23	230± 6.03	230± 6.03	259.2± 7.29	324.55± 5.32
		W.G. Kg	19.6± 5.45	21.9± 0.78	24.6± 0.63	24.6± 0.63	29.1± 1.34	34.25± 2.11
		F.C. Kg	138.18± 4.34	154.6± 4.53	171.22± 4.38	171.22± 4.38	193.22± 5.14	231.19± 6.17
		F.C.R.	7.05± 0.24	7.06± 0.20	6.96± 0.28	6.96± 0.28	6.64± 0.24	6.75± 0.18
Probiotic		I.W. Kg	165± 5	187.5± 5.98	213.1± 6.38	213.1± 6.38	241.9± 6	313.4± 5.26
		F.W. Kg	187.5± 5.98	213.1± 6.38	241.9± 6	241.9± 6	275.4± 6.07	353.4± 5.42
		W.G. Kg	22.5± 1.3**	25.6± 0.37*	28.8± 0.8**	28.8± 0.8**	33.5± 0.43**	40± 0.67*
		F.C. Kg	128.25± 3.17	143.87± 4.79	158.97± 3.61	158.97± 3.61	189.27± 4.06	229.2± 3.55
		F.C.R.	5.70± 0.19**	5.62± 0.25**	5.52± 0.24**	5.52± 0.24**	5.65± 0.30*	5.73± 0.21**
Boldenone undecylenate	Half dose (1ml/90 Kg b.wt)	I.W. Kg	165.30± 2.82	186± 3.44	208± 4.16	208± 4.16	235± 4.34	300.3± 6.85
		F.W. Kg	186± 3.44	208± 4.16	235± 4.34	235± 4.34	265.4± 5.11	338.8± 4.22
		W.G. Kg	22.48± 0.91	28.75± 0.62	30.45± 0.24	30.45± 0.24	31.19± 0.21	32.07± 0.58
		F.C. Kg	136.5± 4.10	154.24± 5.18	172. 8± 5.40	172. 8± 5.40	192.13± 6.65	228.69± 5.33
		F.C.R.	6.50± 0.12	6.62± 0.06	6.40± 0.17	6.40± 0.17	6.32± 0.13	5.94± 0.32
	Full dose (1ml/45Kg b.wt)	I.W. Kg	166. 5 ± 4.3	189.4± 5.6	215.6± 6.08	215.6± 6.08	245.5± 6.2	317.8± 9.53
		F.W. Kg	189.4± 5.6	215.6± 6.08	245.5± 6.2	245.5± 6.2	279.4± 7.18	358.6± 7.16
		W.G. Kg	22.9± 0.43*	26.2± 0.86**	29.9± 1.07**	29.9± 1.07**	33.9± 0.45**	40.8± 0.53*
		F.C. Kg	122.51± 3.73	138.86± 3.72	156.97± 4.33	156.97± 4.33	182.38± 3.65	225.21± 3.56
		F.C.R.	5.35± 0.27**	5.30± 0.25***	5.25± 0.21**	5.25± 0.21**	5.38± 0.23**	5.52± 0.26**

* P < 0.05 ** P < 0. 01 *** P < 0.001 I.W. = Initial body weight F. W = Final body weight

W.G. = Weight gain F.C = feed consumption *Compared with control group.

F.C.R= feed conversion rate (kg feed/kg body gain)

Table 3. Effect of therapeutic dose of Biogen (Probiotic) (1Kg/ton feed) and Equigan (1ml/45 Kg or 1ml/90Kg b.wt) on blood picture in Buffalo calves (Mean + S.E.) (n= 5)

Groups	Parameters	Values Post treatment(4 weeks) 1st	2nd	3rd	4th	5th	6th
Control	RBCs x10^6/mm^3	7.15± 0.20	7.11± 0.39	716± 0.17	7.18± 0.33	7.10± 0.40	7.17± 0.28
	HB. gm %	10.45± 0.39	10.59± 0.25	10.33± 0.41	10.38± 0.32	10.54± 0.35	10.47± 0.28
	PCV%	31.69± 0.30	31.58± 0.29	31.50± 0.28	31.59± 0.31	31.74± 0.30	31.59± 0.28
	WBCs x 10^{-3}	9.44± 0.49	9.37± 0.28	9.42± 0.44	9.48± 0.58	9.52± 0.45	9.43± 0.35
Probiotic	RBCs x 10^{-6}	8.08± 0.27*	8.81± 0.46*	8.55± 0.45*	8.48± 0.42*	87.18± 0.27*	8.88± 0.49*
	HB.gm %	11.55± 0.10*	11.65± 0.30*	11.69± 0.27*	11.25± 0.14*	11.62± 0.20*	11.67± 0.29*
	PCV%	32.79± 0.27*	32.87± 0.34*	32.71± 0.38*	32.78± 0.28*	32.82± 0.32*	32.95± 0.37*
	WBCs x 10^{-3}	9.53± 0.43	9.62± 0.61	9.78± 0.48	9.83± 0.48	9.94± 0.37	9.94± 0.60
Boldenone undecylenate Half dose (1ml/90Kg b.wt)	RBCs x10^6/mm^3	7.50± 0.28	7.61± 0.26	7.53± 0.50	7.39± 0.32	7.40± 0.47	7.40± 0.57
	HB gm %	11.18± 0.31	11.10± 0.29	11.16± 0.28	11.21± 0.39	11.64± 0.33	11.70± 0.50
	PCV%	32.14± 0.38	32.40± 0.49	32.08± 0.40	32.12± 0.35	31.98± 0.40	31.87± 0.37
	WBCs x 10^{-3}	11.08± 0.40*	10.49± 0.34*	10.98± 0.30*	11.18± 0.22*	10.97± 0.18*	10.82± 0.25*
Full dose (1ml/45Kg b.wt)	RBCsx10^6/mm^3	9.10± 0.42**	9.09± 0.37**	9.15± 0.50**	9.11± 0.57*	9.86± 0.81*	9.10± 0.39**
	HB gm %	12.09± 0.50*	11.90± 0.23**	11.88± 0.37*	12.08± 0.29**	12.20± 0.28**	11.49± 0.25*
	PCV%	33.07± 0.48*	32.99± 0.43*	32.88± 0.30**	33.12± 0.33**	32.98± 0.40*	32.90± 0.36*
	WBCs x 10^{-3}	11.68± 0.38**	11.37± 0.67*	11.51± 0.40**	11.32± 0.53*	11.41± 0.52*	11.44± 0.71*

*P < 0.05 ** P < 0.01 *Compared with control group

Table 4. Effect of therapeutic dose of Biogen(Probiotic) (1Kg/ton feed) and Equigan (1ml/45 Kg or 1ml/90Kg b.wt) on protein profile, in Buffalo calves serum. (Mean + S.E.) (n= 5)

Groups		Parameter(g/dl)	Post treatment(month)					
			1st	2nd	3rd	4th	5th	6th
control		T.protein	7.02± 0.26	7.10± 0.32	7.26± 0.30	6.99± 0.22	7.09± 0.29	7.17± 0.34
		Albumin	3.58± 0.23	3.51± 0.21	3.76± 0.19	3.56± 0.17	3.70± 0.27	3.77± 0.18
		Globulin	3.44± 0.21	3.49± 0.25	3.50± 0.15	3.43± 0.21	3.39± 0.20	3.40± 0.19
Probiotic		T.protein	8.39± 0.33*	8.57± 0.22**	8.60± 0.41*	8.29± 0.19**	8.58± 0.49*	8.49± 0.37*
		Albumin	3.55± 0.35	3.63± 0.28	4.08± 0.11	3.51± 0.18	3.95± 0.19	4.10± 0.10
		Globulin	4.12± 0.18*	4.29± 0.10*	4.21± 0.21*	4.02± 0.11*	4.36± 0.27*	4.23± 0.15**
Boldenone undecylenate	Half dose (1ml/90Kg b.wt)	T.protein	8.03± 0.47	7.97± 0.39	7.73± 0.28	7.62± 0.44	7.67± 0.38	7.40± 0.51
		Albumin	3.71± 0.41	3.45± 0.58	3.74± 0.43	3.69± 0.41	3.65± 0.35	3.77± 0.38
		Globulin	3.83± 0.53	3.91± 0.37	3.78± 0.38	3.93± 0.53	3.78± 0.49	3.52± 0.27
	Full dose (1ml/45Kg b.wt)	T.protein	9.03± 0.36**	9.19± 0.41**	9.38± 0.45**	9.26± 0.48**	9.29± 0.68*	9.03± 0.60*
		Albumin	3.80± 0.39	3.77± 0.33	3.90± 0.36	3.60± 0.41	3.74± 0.31	4.15± 0.40
		Globulin	4.20± 0.20*	4.56± 0.27*	4.43± 0.33*	4.57± 0.41*	4.40± 0.35*	4.45± 0.38*

* P < 0.05 ** P < 0.01 *Compared with control group.

Table 5. Effect of therapeutic dose of Biogen (Probiotic) (1Kg/ton feed) and Equigan (1ml/45 Kg or 1ml/90Kg b.wt) on AST, ALT, ALP and glucose in serum of Buffalo calves. (Mean+ S.E.)(n= 5)

Groups	Parameters	Post treatment(month) 1st	2nd	3rd	4th	5th	6th
control	AST U/L	29.06± 0.42	28.92± 0.37	28.83± 0.45	29.05± 0.38	29.08± 0.48	28.59± 0.53
	ALT U/L	14.29± 0.46	14.37± 0.37	14.28± 0.54	14.32± 0.41	14.44± 0.56	14.25± 0.36
	ALP U/L	16.63± 1.31	16.66± 1.05	16.74± 1.27	16.70± 1.07	16.66± 1.26	16.75± 1.19
	Glucose mg/dl	71.04± 1.98	71.78± 1.97	70.89± 2.00	71.16± 2.30	69.95± 2.01	71.10± 2.09
Probiotic	AST U/L	29.24± 0.65	28.99± 0.48	29.70± 0.55	29.23± 0.68	29.31± 0.58	28.81± 0.63
	ALT U/L	14.09± 0.47	14.18± 0.40	14.21± 0.27	14.13± 0.37	14.15± 0.49	14.07± 0.25
	ALP U/L	16.93± 0.59	16.85± 0.72	16.88± 0.69	16.90± 0.57	16.87± 0.41	16.89± 0.69
	Glucose mg/dl	64.18± 1.88*	65.11± 1.90*	63.20± 1.89*	64.22± 1.93*	63.83± 1.99*	64.07± 1.96*
Boldenone undecylenate	Half dose (1ml/90Kg b.wt) AST U/L	29.85± 0.55	29.90± 0.46	29.78± 0.39	30.12± 0.43	29.94± 0.47	30.18± 0.51
	Half dose (1ml/90Kg b.wt) ALT U/L	15.28± 0.41	15.21± 0.71	15.17± 0.61	14.94± 0.48	15.35± 0.55	15.40± 0.47
	Half dose (1ml/90Kg b.wt) ALP U/L	18.65± 1.30	18.80± 1.32	18.67± 1.43	18.74± 1.49	18.83± 1.33	18.55± 1.36
	Half dose (1ml/90Kg b.wt) Glucose mg/dl	72.08± 1.82	71.92± 1.63	71.87± 1.70	71.66± 1.59	71.05± 1.80	71.58± 1.73
	Full dose (1ml/45Kg b.wt) AST U/L	30.76± 0.45*	30.82± 0.58*	30.74± 0.50*	30.92± 0.42**	30.98± 0.41*	31.14± 0.50**
	Full dose (1ml/45Kg b.wt) ALT U/L	16.41± 0.55*	16.35± 0.42**	15.96± 0.46*	15.93± 0.52*	16.29± 0.37*	16.32± 0.55*
	Full dose (1ml/45Kg b.wt) ALP U/L	20.85± 1.32*	20.88± 1.11*	20.98± 1.12*	20.95± 1.10*	21.15± 1.17*	21.05± 1.13*
	Full dose (1ml/45Kg b.wt) Glucose mg/dl	76.95± 1.08*	76.91± 1.13*	76.98± 1.15*	77.10± 1.11*	77.25± 1.96*	77.52± 1.02*

* P < 0.05 ** P < 0.01 *Compared with control group.

Table 6. Effect of therapeutic dose of Biogen (Probiotic)(1Kg/ton feed) and Equigan (1ml/45 Kg or 1ml/90Kg b.wt) on urea, creatinine, calcium and phosphorus in Buffalo Calves serum (Mean + S.E.)(n= 5)

Groups		Parameter (mg/dl)	Post treatment(month)					
			1st	2nd	3rd	4th	5th	6th
control		Urea	22.16± 0.37	22.43± 0.29	22.37± 0.40	22.61± 0.38	22.55± 0.61	22.49± 0.48
		Creatinine	1.98± 0.10	1.84± 0.11	1.88± 0.12	1.79± 0.19	1.75± 0.21	1.68± 0.10
		Ca	11.10± 0.30	11.14± 0.23	11.09± 0.18	11.19± 0.26	11.18± 0.20	11.21± 0.25
		Ph	5.33± 0.41	5.29± 0.34	5.35± 0.29	5.40± 0.44	5.23± 0.51	5.20± 0.33
Probiotic		Urea	22.48± 0.41	22.60± 0.73	22.59± 0.63	22.77± 0.67	22.82± 0.58	22.64± 0.55
		Creatinine	1.91± 0.27	1.81± 0.14	1.83± 0.18	1.74± 0.16	1.72± 0.26	1.63± 0.22
		Ca	14.03± 0.74**	13.12± 0.51**	14.10± 0.69**	14.21± 0.71**	13.98± 0.83**	14.08± 0.80**
		Ph	7.07.± 0.63*	7.12± 0.70*	7.09± 0.55*	7.19± 0.64*	7.15± 0.48*	7.17± 0.60*
Boldenone undecylenate	Half dose (1ml/90Kg b.wt)	Urea	22.14± 0.42	22.38± 0.42	22.19± 0.48	22.49± 0.39	22.37± 0.31	22.28± 0.38
		Creatinine	2.06± 0.24	1.97± 0.20	1.99± 0.18	1.86± 0.26	1.90± 0.28	1.75± 0.19
		Ca	11.82± 0.95	11.94± 0.86	11.90± 0.69	11.98± 0.83	11.87± 0.58	11.88± 0.63
		Ph	5.53± 0.68	5.94± 0.83	5.87± 0.59	5.96± 0.88	5.75± 0. 68	5.87± 0.74
	Full dose (1ml/45Kg b.wt)	Urea	22.08± 0.27	22.22± 0.18	22.28± 0.37	22.50± 0.40	22.43± 0.60	22.37± 0.58
		Creatinine	2.39± 0.11*	2.27± 0.14*	2.29± 0.10*	2.34± 0.13*	2.32± 0.12*	2.28± 0.14**
		Ca	13.18± 0.67*	13.50± 0.92*	13.32± 0.77*	13.07± 0.65*	13.19± 0.71*	13.31± 0.67*
		Ph	6.99± 0.50*	7.05± 0.48*	6.95± 0.53*	7.28± 0.68*	7.55± 0.61*	7.59± 0.83*

* P < 0.05 ** P < 0.01 *Compared with control group.

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الملخص العربى

كفاءة البولدينون انديسيلينات والبروبيوتك كمحفزات نمو على ذكور عجول الجاموس

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يعتبر البر وبيوتك والبلدينون انديسيلينات من محفزات النمو التي يستخدمها مربى ماشيه التسمين لذلك استهدفت هذه الدراسة استبيان المزيد من المعلومات عن كفاءة المركبين في زيادة وزن حيوانات التسمين ومعرفه الآثار ألجانبيه لهم. تم أجراء هذه الدراسة على عدد ٢٠ من ذكور الجاموس عمر 7-8 أ شهر اوزانها تتراوح بين ١٦٤- ١٧٠ كيلو جرام بإحدى مزارع تسمين المواشي بمركز منيا القمح بمحافظة الشرقية تم تقسيمهم إلى ٤ مجموعات, كل مجموعة منها تحتوى على عدد ٥ عجل.الأولى منها بصحة جيدة غير معالجة مجموعةضابطة, الثانية حيوانات بصحة جيدة وتم عطائها البر وبيوتك(بيوجين) ١كجم/ طن علف, المجموعة الثالثة حيوانات بصحة جيدة وتم حقنها في العضل نصف الجرعة العلاجيه من البلدينون انديسيلينات ١سم/٩٠كجم من وزن الحيوان, المجموعة الرابعة حيوانات بصحة جيدة وتم حقنها في العضل بالجرعه ألعلاجيه ١سم/٤٥كجم من وزن الحيوان من البلدينون انديسيلينات تم حقن البولدينون كل ٢٨ يوم خمس مرات لمدة(١٤٠ يوم). تم أخذ عينتين دم من كل حيوان في كل المجموعات عند الشهر الأول, الثاني, الثالث, الرابع, الخامس والسادس. الأولى على هيبارين وذلك لدراسة التأثيرات على صورة الدم والأخرى بدون مانع للتجلط لفصل المصل وذلك لقياس بعض مكونات الدم.

يتبين لنا من تلك الدراسة أن البروبيوتك والبلدينون انديسيلينات أحدثا زيادة معنوية في وزن الجسم المكتسب, عدد كرات الدم الحمراء , تركيز الهيموجلوبين ,حجم الخلايا المضغوطة والعدد الكلى لكرات الدم البيضاء, البروتين الكلى , , الجلوبيولين, الكالسيوم والفوسفور دون اى تاثيرعلى الزلال ونقص في معدل التحويل الغذائي .

أثبتت الدراسة أن إعطاء البروبيوتك بالجرعة العلاجية ليس له اى تأثير على مستوى انزيمات الكبد (انزيم الالانين أمينوترانسفيريز وأنزيم الأسبارتيت أمينوترانسفيريز وانزيم الفوسفاتيز القاعدي) وادى الى حدوث نقص معنوى فى سكر الدم و ليس له اى تأثير على مستوى اليوريا والكرياتينين. البلدينون انديسيلينات بالجرعه العلاجيه أحدث زيادة معنوية في انزيمى الالانين أمينوترانسفيريز و الفوسفاتيز القاعدي و أنزيم الأسبارتيت أمينوترانسفيري وزيادة معنوية في مستوى سكر الدم و الكرياتينين ونقص غير معنوي في اليوريا في مصل الدم في حاله البلدينون انديسيلينات بنصف الجرعه العلاجيه أحدثت زيادة غير معنوية في صوره الدم صوره البروتين, سكر الدم ,اليوريا والكرياتينين في مصل الدم وزيادة غير معنوية فى انزيمات الكبد (انزيم الالانين أمينوترانسفيريز وأنزيم الأسبارتيت أمينوترانسفيريز وانزيم الفوسفاتيز القاعدي) عند مقارنتهم بالمجموعة الضابطة . نستخلص من هذه الدراسة أن البروبيوتك والبلدينون انديسيلينات كان لهم اثر جيد في زيادة وزن الحيوانات التي تم علاجها بالجرعه العلاجيه ولكن البلدينون انديسيلينات أحدث تأثيرات عكسية على بعض القياسات البيوكيميائية. لذلك ينصح باستخدام البروبيوتك بالجرعات العلاجية عن طريق العلف كمحفز للنمو حيث انه ليس له اى أعراض جانبيه على الوظائف الحيوية للحيوان.