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OXALIC ACID IN SUGAR BEET VINE SILAGE AND EFFECTS ON :III - MICROORGANISMS AND SOME RUMEN LIQUER PARAMETERS.

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ABSTRACT

Twelve adult Rahmany rams 62.4kg of body weight and 3 years of age were used in this study , with aimed to overcome oxalic acid in sugar beet vein silage and to estimating the effects of oxalic acid residual on rumen microorganisms activities. The animals were randomly divided into four groups , assigned to four digestion trials. The experimental rations were50%concentrate feed mixture(CFM)+50% roughage as berseem hay for control or one of sugar beet top silages either, untreated (USBS),chemical treated(CSBS) or biochemical(B-CSBS), for second , third and fourth rations respectively .Trials were conducted and lasted for 22 days .The results of chemical composition for tested ingredients and calculated chemical composition of the consumed rations fed by adult Rahmany rams reveals' that the B-CSBS was higher of CP and NFE, while the CF and Ash had lower values when compared with control and USBS groups, however the means of cell wall constituents of experimental diets indicated that the B-CSBS silage had the lowest contents of neutral detergent fiber (NDF),acid detergent fiber(ADF),acid detergent lignin(ADL),hemicelluloses and cellulose. on the other side ,the data of oxalic acid was clearly that the chemical and biochemical sugar beet tops silages were lower of oxalic acid than those of untreated sugar beet tops .The digestibility of B-CSBS was higher in OM ,CP, EE and NFE compared with CSBS, USBS and control diet . At the same time the USBS was significantly higher ($p<0.05$) for NDF, ADF, ADL, cellulose and Hemicellulose than other tested groups. while feed intake of USBS was significantly ($P<0.05$)higher compared with other groups and the values were ranged between 2316-2952g / h /d dry matter. Ruminal TVFA were significant higher ($p<0.05$) of acetic, butrtate and iso-biotrate for USBS group compared with the other tested groups, whereas propionate and valerate were significantly lower ($p<0.05$) for the same treatments in this respect .The highest values of total celluolytic bacterial, total bacterial and total protozoal count were obtained at 3 hrs post feeding of USBS was significantly ($P<0.05$) lower. While the rumen nitrogen in both of chemical and biochemical treated sugar beet top silage caused increase of NPN in rumen, however, total nitrogen of B-CSBS was significantly($P<0.05$)higher at 3 and 6 hrs post feeding compared with other experimental groups..

Keywords: Sugar beet top , oxalic acid , chemical treatment , biochemical treatment . digestibility, economic efficiency, feed conversion, and rumen activity.

INTRODUCTION

The limiting factor of the animal production in Egypt and most developing countries is the gap between the requirement of ruminant and available amount of feeds. which is equivalent to 5.6 million tons of DM (about 3.36 million tons of DM).The gap could be covered by the use of different sources of by-products and wastes.Also there are 877763 tons of fresh sugar beet tops (SBT)contained about 84265 tons DM as reported by(Behraka et al.2001).Moreover,about 46522 feddans were cultivated with

sugar beet in year 2000 at Dakahlia Governorate,it also produced about 581525 tons of fresh SBT contained 60575 tons DM.The sugar beet tops can be used for livestock feed, which sheep and cattle ranchers allow grazing of beet fields in the fall to utilize tops. Cattle and sheep also will eat small beets left in the field after harvest but producers of grazing livestock in harvested fields should be aware of the risk of livestock choking on small beets also. Sugar beets tops that produce about 15 tons /feddans of roots and 4 tons / feddans of TDN . Tops are an excellent source of protein,vitaminA and carbohydrate(Cattanach et al. 1991).Beet top silage is best fed in combination with other feeds.So ensiling of sugar beet tops may contribute in solving some problems concerning resources shortage of animal feeding, especially in summer season and to minimize the pollution. It may offer a reduction of feed cost and minimize quantities of the expensive.Organic oxalic acid is an important element, even essential, to maintain and to stimulate peristaltic motion in our body.It is when oxalic acid is cooked or processed that it becomes dead, or inorganic and thus harmful to our body. Oxalic acid readily combines with calcium. If both oxalic acid and calcium are organic at the point of combination, the result is beneficial where the oxalic acid helps the digestive assimilation of the calcium. Also this combination helps stimulate the peristaltic functions in our body. People with recurrent kidney stones have a tendency to absorb higher levels of dietary oxalates compared to those not prone to kidney stones. A low-oxalate diet is eating foods containing less than 50mgs of oxalic acid per day.These tiny crystals can irritate the human tissues, and get lodged in the stomach, kidneys and bladder as "stones". Oxalic acid is present in abundance in many plant products, with especially high content in sour grass, buckwheat.Other plants containing high levels of oxalates are amaranth,spinach,beets, cocoa, most nuts, most berries and beans .Even tea leaves contain among the highest measured concentration of oxalic acid. However, tea beverages typically contain only very low to moderate amounts of oxalate due to the very small amount of leaves used for brewing. Just remember, organic oxalic acid is essential for your body and is completely harmless if consumed in organic form**.** The objective of this study was to investigate the effect of feeding untreated sugar beet tops silage and chemical or biochemical untreated sugar beet tops silage at different ratios on nutrients digestibility, rumen activity, feed conversion and economic efficiency of Rahmany rams**.**

MATERIALS AND METHOD

This study was carried out in El –Serw Animal Production Research Station, Animal Production Research Institute, Agriculture Research Center , through the year 2009 **.**

Silage making

Sugar beet tops were collected from sugar beet fields at the harvesting time and wilted for 72 hours to diminish the moisture content to about 65-70%before ensiling ,Wilted sugar beet tops was ensiled between feed toughs, where 20 cm layer of rice straw spread on the ground as bed to absorb

seepage and to prevent contamination with dusts.Molasses was added for sugar beet tops every layer at a level of 5% of fresh weight basis to increase the activity of silage fermentation. Also,ground limestone (calcium carbonate) was added at 3% of sugar beet tops to compensatory calcium binding with oxalate to give chemical treated sugar beet tops (CSBS).Whereas calcium carbonate at 3% plus 1% Effective microorganisms solution probiotic (contained photosynthetic bacteria (*Rhadopseudomonas plustris* and *Rhodbacters phacrodes),*lactic acid bacteria *(Lactobaiullus plantaru+Lactobaiullus case* and *Streptococcus lactis*)**,**yeasts (*Saccharomyces Cervisiae*) and actenonycetes (Microhiza) were added during ensilage, to give biochemical sugar beet top silage(B-CSBS).The material was ensiled in plastic bags for 2 months before feeding. After ensilage period, the color and odor were examined and samples were taken for chemical analysis, oxalic acid was determined and silage quality test was performed.

Experimental animals

Twelve adult Rahmany rams were nearly equal in body weight 62.4kg were used with four groups (3 animals each) with four digestible trials. The animals were fed according to NRC(1990**).**

Experimental rations and management

The first group animals fed the control ration consisted of (on dry matter basis) 50%concentrate feed mixture (CFM)+ 50% berseem hay (BH), whereas all other tested groups were fed 50%CFM addition to 50% sugar beet tops silage (SBTS) untreated rations (1) ,or treated rations(chemical and biochemical)as in rations(2 and 3) respectively. The rations were offered two times daily at 8 am. and 3 pm .Rams were allowed to drink water all day and were kept under the routine veterinary supervision through the whole feeding trial.(Feed intake calculated as difference between feed given – residual).

Concentrate feed mixture

Concentrate feed mixture is consists of cotton seed**17.0**.%, yellow corn 44.50%wheat bran 24.5%, soy been meal (44% CP) 7.0 %, molasses 5.00% , common salt 0.5% % and limestone 1.50%.

Digestibility trials

Four digestibility trials were conducted to determine nutrients digestibility coefficients and nutritive values of the experimental rations.Samples of feces and urine were taken daily from each animal with 24 hours interval during the collection period .The samples of rations and feces were composted and representative samples were analyzed according to A.O.A.C.(2000) .

Rumen liquor samples

Rumen liquor samples were collected before feeding(0 time) and 3 and 6 hours after morning feeding from rams using a stomach tube and filtered through three layers of cheese cloth into plastic containers and kept in refrigerator at 4°C.The pH value was determined directly using digital pH meter (mode HI 8424)**.**The concentration of total volatile fatty acid (TVFA's) was determined according Warner(1964).The concentration of NH3-N was determined using saturated solution of magnesium oxide as method described by Conway (1958).

Rumen microorganism's count

Direct microscopic counts of bacteria was determined according to Russell and Dombrowski (1980).reported that ruminal TVFA production Closely related to pH, which can be considered as an .Baker(1990).who found that feeding ,silage high in NH_3-N concentration was important regulator of microbial yield. associated with high ruminal NH_3-N.Enumeration of Cellullolytic bacteria was determined according to Mostpropable -Number producers as described by Mann (1968).Total protozoa count were determined according to the methods descried by (Abou-Akkada et al. 1969).

Samples collection

At the preliminary period end, feces and urine samples were collected from three animals daily for seven successive days for nutritive values determination. Representatively samples of fresh feces were dried and ground then mixed and kept for chemical analysis and estimation of nutrient digestibility was done, and urine was collected after mixed with 20 ml conc. Sulfuric acid to keep ammonia messed.

Total nitrogen

Total nitrogen and non protein nitrogen (NPN) were determined according to A.O.A.C.(1995).True protein nitrogen was obtained by subtracting the NPN from total protein nitrogen .

Proximate analysis

Samples of rations and feces and urine were analyzed according to A.O.A.C. (2000).Plasma biochemical analysis was done using Biomerieux reagent kits. TVFA of silage aqueous extract was measured by the methods of Patel and Mudgal (1974).Oxalic acid was determined according to(Fengwu et al.1999).were used for determination of total protein(Weichselbaum,1989),albumin (Doumas et al.1971),globulin(calculatedbydifference),urea(Patton and Crouch, 1997). Total cholesterol (Monnet,1963) creatinin (Bartiles,1971)and bilirubin Elveback, (1970).Whereas haematocrit (Linne and Ringsrud ,1992), white blood cells (Miller and Weller , 1971).

Economic efficiency

Economic efficiency expressed as the daily feed cost.The price of one ton was 2200 LE for concentrate feed mixture, 1000 LE for berseem hay, 80 LE for sugar beet tops silage and. Calcium carbonate 5.00 LE / 50 kg and probiotic10.00 LE/1kg according to prices of year 2009[$=5.75LE(Egyptian Pound)]

Statistical analysis

All numerical data obtained were statistical analyzed by SAS (1996) procedures for personal computer. When F-test was positive, least significant differences Duncan (1955) within program SPSS was done to determine the degree of significance between means.

RESULTS AND DISCUSSION

Chemical composition of feedstuffs and experimental rations

Chemical composition of tested ingredients and experimental rations fed by adults Rahmany rams in digestibility trials reveals that the B-CSBS ration was higher of CP and NFE, whereas lower of CF and Ash compared , with control group and USBS So, result clearly that inclusion of CP and NFE was increased with biochemical sugar beet tops silage than other tested treatments. USBTS group recorded lower value of NFC compared with other tested groups as same time ash was higher in both USBS and CSBS measure by B-CSBS and control groups these results are consistent with those obtained by (Bendary et al. 2000) and (Ahmed et al. 2003).on other side the results showed that the untreated sugar beet top silage(USBS), CSBS and B-CSBS groups were lower in DM(g/h/d) and the values were 62.54, 65.41 and 68.04% respectively, compared with control group 88.68.The same trend was obtained by Deraz (1996). From chemical composition results can show that the analysis of the experimental feedstuffs on dry matter bases, the following discussions will be depending on the comparison of USBTS, CSBTS and BSBTS. On the other hand the oxalic acid contains of CSBS and B-CSBS were lower than untreated .The B-SBTS gave the lower values of NDF, ADF, ADL and cellulose than untreated and chemical treated silage this results was agree with (Bendary et al. 1992a)and (Mohi El-Dien et al 2000).who indicated that SBT fresh, or silage made by different methods had high feeding value and more palatable compared to other roughage by–products .However , there are some problems to used the SBT on the form of green sugar beet tops because its high moisture, potassium and oxalic acid, decreasing of crude fiber of BSBTS back to calcium carbonate supplemented and the effect of the libration of cellulose from its bonds with lignin delignification which increased solubility.Similar results have been found by (Abd El-Hamid et al.1989),(Chauhan and Kakkar 1981)and Mohamed(1998),who found that treatment sugar beet tops silage with 1% urea and 3 % molasses at ensiling decreased its NDF, ADF and ADL .On the other hand ,the means of cell wall constituents of experimental diets are presented in Table(3).B-CSBS silage had the lowest contents of neutral detergent fiber(NDF),acid detergent fiber(ADF),acid detergent lignin (ADL), hemicelluloses and cellulose .These results agree with the results of (Parfitt et al 1982) who found that sugar beet top silage contained 60.6 % CWC , 54.9 % ADF , 5.7%hemicelluloses,37.7%, ADL and10.6% cellulose .These results are more than those obtained here .

Table (1): Chemical composition of ingredients, different types of silage and experimental rations .

items	pallets	BH	RS	Experimental rations on (DM bases)			
				CONTROL	USBTS	CSBS	B-CSBS
Chemical composition (%)							
DM	89.82	88.11	89.56	88.68	62.54	65.41	68.04
OM	90.17	89.23	81.15	89.92	84.75	81.55	87.47
CP	13.92	14.16	3.42	13.97	12.58	12.66	14. 89
CF	11.78	24.79	33.74	18.29	14.30	14.00	7.61
EE	3.29	3.05	1.63	3.24	3.36	3.09	3.36
Ash	9.83	10.77	18.85	10.08	15.25	18.45	12.53
NFE	61.18	47.23	44.13	54.42	54.51	51.80	61.61
NFC				30.58A	22.27B	27.16A	34.63A
NDF				42.13A	46.54A	38.64B	34.59B
ADF				33.28A	36.89A	32.75A	28.94B
ADL				10.85A	11.42A	9.76B	8.79B
Hemicellulose				8.85A	9.65A	5.89B	5.65B
cellulose				22.43B	25.47A	22.99B	20.15B

A , B means having different superscripts within the same row are significantly different at (P<0 .05) differ.
BH = berseem hay , USBS = Untreated sugar beet silage, CSBS = Chemical treated sugar beet tops silage.
B-CSBS = biochemical treated sugar beet tops silage.

Oxalic acid

Sugar beet tops was high contain a natural oxalic acid specially with untreated sugar beet tops , the data in Table (2) indicated that the chemical and biochemical sugar beet tops silage were lower contain of oxalic acid than untreated sugar beet tops, this results back to calcium carbonate added to fresh sugar beet tops (SBT) during ensilage time .This agree with the results obtained by(Abdelhamid and Saleh ,1999).

Table (2) : Oxalic acid contain of diets, feces ,urine, rumen liquor and Blood mg) overall period.

Items	Oxalic acid mg / 100 gm or ml over all period		
	USBS	CSBS	B-CSBS
rations	1767.6A	711.00B	656.60B
Feces	480.60A	154.80B	133.20B
Urine	757.80A	311.40B	271.80B
rumen liquor	1297.8A	284.40B	214.20B
Blood	446.40A	126.00B	50.40B
Total excretion	1238.40A	466.20B	405.00B

A , B means having different superscripts within the same row are significantly different at (P<0 .05) differ.

Nutrient digestibility and feeding values

Data in Table (3) indicated clearly that B-CSBS was significantly higher ($p< 0.05$) in digestibility's of OM,CP,CF,EE and NFE compared with CSBS,USBS and control diet. At the same time the untreated sugar beet tops (USBS) was significantly lower ($p<0.05$) for NDF, ADF ADL, cellulose and hemicelluloses than other all tested treatments. This result may be due to increasing in micro organisms microorganisms activity and by decreasing the level of oxalic acid at rations.

Table(3):Digestion coefficients and nutritive values(%on dry matter basses) of rams fed different type of sugar beet top silages .

Items	B-CSBTS	CSBTS	USBTS	COROL
DM	64.78A	62.43B	65.34A	67.23A
OM %	62.40B	60.94B	64.84B	68.37A
CP%	65.97B	63.87B	65.44B	71.11A
C F%	55.41B	49.34B	61.71A	66.97A
EE	67.15A	63.85B	66.34A	69.38A
NFE%	68.25A	61.17B	63.35A	67.57A
NDF	63.74B	61.28B	68.43A	71.25A
ADF	58.22B	56.50B	61.71A	64.12A
ADL	8.79	7.11	7.66	8.91
Hemicellulose	62.37	65.11	66.23	64.57
cellulose	44.83B	57.07B	63.33A	66.18A

A , B means having different superscripts within the same row are significantly different at (P<0 .05) differ.

Microorganisms activity and by decreasing the level of these results are in agreement with the results obtained by(Agosin et al.1986).who indicated that fungal pretreatment on the biodegradability of cell wall ,structural, physical characteristics, lignin and phenolic by rumen microorganisms increase DM digestibility.

Hematological picture

The hematological picture of Rahmany rams fed sugar beet top silage Table (4),showed significantly($p<0.05$)decrease in erythrocyte and leucocytes in USBS ration compared with CSBS, B-CSBS and control group, whereas two fractions of white blood cells(neutrophile and lymphocyte%)and eiosinophile were significantly increased($p<0.05$) with USBS group , however , the monocyte significantly decrease to same group .This increases of lymphocyte and neutrophile for USBS group may be due to the increases of oxalic acid level and the decreases of protein intake compared with CSBS, B-CSBS and control groups . Addition to that, oxalic acid have an enhancement effect to the humeral immune response and increase white blood cells as reported by (Pollman et al, 1980).

Table (4): Hematological parameters of rams as affected by different experimental rations .

Items	Control	Sugar beet tops		
		USBS	CSBS	B-CSBS
Biochemical parameters .				
Bilirubin (mg /100ml)	0.52A	0.68A	0.29B	0.23B
Alk-P-ase (lu / L)	76.4A	86.57A	48.23B	31.55B
Total protein (g /100g)	8.56	7.94	8.84	8.97
Albumen (g / 100g)	4.64	4.73	4.72	4.76
Globulin (g / 100 g)	3.92	3.21	4.12	4.21
Hematological parameters .				
Hematocrit values (%)	18.5B	22.34A	16.97B	15.76B
Platelets (PLT) ×10 3	622A	584A	348B	367B
Stab cell	0.58 A	0.43B	0.61A	0.64A
Total lipids	6.12	5.73	6.61	6.89
Triglycerides (mg/dl)	80.15B	86.91A	80.86A	76.24B
Cholesterol (mg/dl)	58.37A	67.81A	41.48	38.97B
Free fatty acid (%)	381.3A	428.7A	291.0B	235. B

A , B means having different superscripts within the same row are significantly different at (P<0 .05) differ.

On the other hand bilirubin, Alkine phosphates , platelets , Cholesterol and Free fatty acid were significantly(P<0.05) decrease for CSBS and B-CSBS compared with USBS and control groups .

Feed intake of the experimental rations

The results of feed intake (Table 5).Showed that the CSBS and B-CSBS groups were significantly decreased in DM intake (g/h/d) and the values were 60.66 and 58.94% respectively, compared to USBS and control groups. The same trend was obtained by Deraz (1996).Rahmany rams fed control and USBS recorded higher values of concentrate feed mixture intake recorded higher significant than other tested rations, the ranged between 27.98 and 28.17 kg /h/ overall period. On the other side notice that those groups fed USBTS ration had significantly lower (P<0.05) of TDN and DCP incorporative with others. Water consumption is positively correlated with DM intake these results are in agreement with the results obtained in other study Sultan,(1995).

Table (5) : Daily feed intake of sugar beet pulp silage treated or untreated by rahmany rams .

Items	Control	USBTS	CSBTS	BSBTS
CFM(kg/h) overall period	27.98A	28.17A	26.46B	26.73B
Roughages(kg/h)overall period	23.43B	36.83A	36.67A	31.79A
DM intake (g/h/d)	62.55A	64.94A	60.66B	58.94B
TDN	58.48B	52.87B	63.49A	55.74B
DCP	9.22A	8.04B	9.29A	10.60A
Water / m/h/d	3667A	3850A	3243B	3467B

A , B means having different superscripts within the same row are significantly different at (P<0 .05) differ.

Molar proportion of ruminal total volatile fatty acid (TVFA)

Differences between acetic, propionate, butyrate and Iso-Biotrate values of rumen liquor of rams fed on treated (chemical or/ bio-chemical) or untreated sugar beet top silage in Table(6).

Table(6) : Molar proportion of ruminal volatile fatty acid (VFA) of Rahmany rams fed on different type of sugar beet top silages.

Items	Time	Control	USBS	CSBS	B-CSBS
Acetic acid (%)	0	57.23B	52.47B	63.81A	54.36B
	3	57.71B	53.68B	64.28A	56.69B
	6	55.13B	50.97B	62.68A	54.12B
Propionic acid (%)	0	26.45A	21.59B	23.73B	27.66A
	3	25.98A	20.48B	23.08B	25.77A
	6	24.88A	18.86B	22.37B	24.96A
Butric acid (%)	0	12.03	13.58	11.46	11.88
	3	12.94	12.97	11.73	10.84
	6	12.31A	12.59A	12.07A	10.37B
Iso- butric acid (%)	0	1.91	1.88	1.71	1.69
	3	1.82	1.96	1.79	1.84
	6	1.93	1.73	1.79	1.72
Valeric acid (%)	0	1.61	1.66	1.75	1.74
	3	1.59	1.49	1.52	1.55
	6	1.72	1.82	1.60	1.59
Iso- valeric acid (%)	0	1.95A	1.57C	1.83B	1.87B
	3	1.88A	1.34C	1.58B	1.69B
	6	1.73A	1. 29C	1.44B	1.54B

A , B and C means having different superscripts within the same row are significantly different a (P<0 .05) differ.

Data clearly that there significant lower($p< 0.05$) in acetic, butrtate and iso-biotrate for CSBS and B-CSBS groups compared to control and USBS groups, whereas propionate and valerate were significantly higher ($p<0.05$) for the same treatments.The A/Pratio indicated an improvement of propionic production in the diet B-CSBS silage(B-CSBS).Results obtained confirming were those represented by(Mohammed et al.2003) and El-Ayek (1999).

Rumen liquor parameters

Rumen liquor parameters are presented in Table(7).NH3-N concentrations are gradually decreased by sampling time till the 6 th hours. The pH values decreased only till the 3 th hours these results of pH are in harmony agree with those obtained by Khalifa (1972)who noticed that pH of rumen liquor with sheep was high (7.1) before feeding then declined to (6.8) at 3 hours. Van Soest (1983)stated that the optimum pH value for growth of cellulytic microorganisms was 6.7 and the range for normal condition was about ± 0.5 pH degrees.at the three hrs post-feeding ruminal pH was lower but ammonia nitrogen concentration were higher than before feeding .Baker(1990) found that sugar beet top silages high in NH3-N concentration and associated with high ruminal NH3-N concentration. He also reported that ruminal total TVFA's concentration decreased with feeding sugar beet tops silage .The normal relation of rumen parameters were realized , since there were positive relation between pH value and NH3-N concentration and negative relations between pH value, NH3-N concentration and TVFA´s levels.since consuming NH3-N by ruminal micro –flora producing TVFA´s leading to lowering pH values .B-CSBS recorded the lowest pH ($P<0.05$) whereas it was significantly lower($p<0.05$) in TVFAs compared with other tested groups.This result may be due to the degradation of protein to ammonia and carbohydrates fermented to TVFA's in the rumen . Ruminal microorganisms utilize more NH3-N when more energy sources are fermented Hungate (1996),Russell and Dombrowski (1980)reported that ruminal TVFA's production was closely related to ruminal pH, which can be considered as an important regulator of microbial yield.

Table (7): Effect of sugar beet vine silage treated or untreated on rumen activities

Parameters	Time	Experimental rations			
		BH	USBTS	CSBTS	B-CSBTS
pH value	0	6.21	6.55	6.41	6.33
	3	6.11	6.23	6.18	6.08
	6	6.17	6.31	6.27	6.20
NH3-N (mg /100ml)	0	19.26	18.89	17.57	18.11
	3	23.67A	21.32A	19.87B	21.58A
	6	21.77A	20.94A	18.86B	19.31B
Total VFA meq / 100 ml	0	8.24B	11.59A	12.56A	9.85B
	3	13.87B	16.73A	17.67A	13.53B
	6	10.51B	13.22A	14.24A	9.15B

A, B means having different superscripts within the same row are significantly different at (P<0 .05) differ.

Total celluolytic bacterial count of rumen liquor

The results in Table (8 a) showed that the highest values of total celluolytic bacterial were obtained at 3 hrs after feeding , the data showed clearly that USBS group was significantly (P<0.05) lower value (2.08) followed by CSBS (4.68) , control (3.91) and B-CSBS (5.57) .respectively .while(Behraka et al. 2001) reported that a large and more active bacterial population in the rumen may help to increase the rate of digestion. These results are in agreement with (Nour et al.1989), who report that feeding animals on concentrate with roughages increased the total protozoal count in the rumen .

Table (8 a) : Effect of different type of sugar beet top silage on cellullolytic count of rumen of microorganisms

Items	Time	Control	USBTS	CSBTS	B-CSBTS
Cellullolytic bacterial(104 / ml)	0	2.46B	1.91C	2.91B	3.16A
	3	3.91B	2.08C	4.68A	5.57A
	6	2.64C	2.34C	3.72B	4.65A

A , B and C means having different superscripts within the same row are significantly different at (P<0 .05) differ.

Total bacterial count of rumen liquor

Sugar beet top silage in Rahmany rams ration has a great effect on the increase of the total viable bacteria count in the rumen, (Table 8 b). untreated sugar beet top silage (USBS) was significantly (P<0.05) decrease in total bacterial count compared with a control , chemical and biochemical sugar beet top silage groups.On the other side bacterial counts was significantly higher (p< 0.05) for biochemical sugar beet top silage (B-CSBS) before feeding and at 3, 6 hrs of post feeding ,the values were 1860 , 2617 and 4346 $x10_7$ ml).These values were over than other tested treatments. Whereas the lowest significant values recorded for USBS at 6 hrs post feeding followed by control , CSBS and B-CSBS groups .The results obtained from this study are in harmony with those of (Kurihara et al.1968) who observed that the peak of bacterial counts was between 4 and 6 hr's after feeding .

Table (8 b): Effect of different type of sugar beet top silage on bacterial count of rumen of microorganisms

Items	Time	Control	USBTS	CSBTS	B-CSBTS
Total bacterial count (107/ ml)	0	1519A	1186C	1347B	1860A
	3	2175B	1862C	2080B	2617A
	6	3818B	2497C	3576B	4346A

A , B and C means having different superscripts within the same row are significantly different at (P<0 .05) differ.

Total protozoal count of rumen liquor

Data in (Table 8c) showed that after 3 hrs of feeding different types of sugar beet top silage the lowest total protozoal count was recorded for USBS and the value was (2.88) compared to the other tested treatments ,(3.41, 3.52 and 4.79) for control, CSBS and B-CSBS groups, however ,there is not variation between the three treatments.

Table (8c): Effect of different type of sugar beet top silage on protozoa count of rumen of microorganisms

Items	Time	Control	USBTS	CSBTS	B-CSBTS
Total protozoal count(104 / /ml	0	3.97A	2.76B	3.88A	4.61A
	3	3.41B	2.88B	3.52B	4.79A
	6	2.97B	2.35B	3.11B	4.27A

A , B means having different superscripts within the same row are significantly different at (P<0 .05) differ.

These results agreed with those obtained by Sony and Sharma (1982),who found that an increasing in ciliate protozoal count with increasing concentrate level in diet .This possibly related to its to ingest starch. Maximum protozoal counts were observed at 3 hrs post feeding than after feeding.

Rumen nitrogen

Chemical and biochemical treated sugar beet top silage caused increase of NPN in rumen liquor ,data in Table(9) .Total nitrogen of B-CSBS was significantly (P< 0.05) higher at 3 and 6 hrs post feeding compared with other tested groups. Tamminga and Oreau (1991). Reported that the oxalic acid and Lipid were decreasing total nitrogen and NPN concentration in the rumen , whereas, they suggested that, this effect was due to the negative effects of fats on fermentation . On the other hand free fatty acids were decreased after 3 hours of post feeding in all treatments, while control group had significantly (P<0.05) higher values at 0, 3 th and 6 th hour of post feeding , whoever USBS group was recorded higher value of Free fatty acid compared with chemical and biochemical treated silage and control groups . these results are agree with those obtained by Khalifa (1972), who noticed that total nitrogen , true nitrogen and NPN of rumen liquor of sheep were high before feeding then declined at 3 hours .

Table (9): Effect of sugar beet vine silage treated or untreated on rumen activities

Parameters	Time	Experimental rations			
		Control	USBTS	CSBTS	B-CSBTS
Total Nitrogen(mg /100ml)	0	156.0A	150.0B	154.0A	161.0A
	3	193.0A	175.0B	182.0A	190.0A
	6	176.0A	167.0B	174.0A	179.0A
True nitrogen (mg/100ml)	0	131.4A	120.96B	126.8A	135.2A
	3	162.1A	147.0B	144.5B	159.6A
	6	147.84	140.28	137.76	147.84
NPN (mg/100 ml)	0	24.96A	23.04A	19.2B	17.76B
	3	28.88A	25.00A	22.5B	21.40B
	6	25.16A	23.72A	20.20B	19.16B
Free fatty acid(µ mol/L)	0	4.92A	4.58A	3.71B	3.47B
	3	4.46A	3.97A	3.45B	3.19B
	6	4.81A	4.26A	3.88B	3.34B

A , B means having different superscripts within the same row are significantly different at (P<0 .05) differ .

Feed costs

Feed costs are presented in Table(10)which reveals significant differences (P<0.05) in costs among different groups. Rams fed control ration showed the highest average daily feed cost (P<0.05).However, rams fed B-CSBS had lower feed cost than control group.These results back to cheeped sugar beet tops than berseem hay .and cost of chemical and biochemical silage.These results are in accordance with those obtained by (Bendary et al. 2000).who found that cows fed on sugar beet tops with concentrate were the most economic .This study cleared that use of sugar bet tops silage in ruminant feeding up to 50%of their requirements it decreased feed costs with 22.84, 34.16 and 26.74 (LE / h).of berseem hay price .for USBS, CSBS and B-CSBS respectively .Data are in agreement with Murdoch (1962) who reported that silage in animal feeding is more economic compared with other agriculture wastes .

Table (10): Feed cost of the experimental rations (on bases of feed intake).

Items	Experimental rations			
	Control	USBTS	CSBTS	B-CSBTS
Intake Kg/ h / overall				
Concentrate	27.85A	28.25A	23.80B	26.90A
Roughages	23.45B	36.85A	36.70A	31.85A
Cost of Feed intake (LE)	84.72A	65.88B	56.68B	62.53B
Net revenue %	0.00	22.24B	33.09A	26.1B

A, B means having different superscripts within the same row are significantly different at (P<0 .05) differ.

Price of concentrate =2200 (EP/ton), berseem hay =1000(EP/ton), USBS=80(EP/ton) , CSBS =85, (EP/ton), B-CSBS= 95 (EP/ton) .

CONCLUSION

Chemical and bio-chemical sugar beet tops silages as sources of roughage is more efficient especially to replace berseem hay and to save a part of concentrate feed mixture.Using sugar beet tops 50% in the rations of Rahmany rams improve feed conversion and economic efficiency.

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تأثير حمض الأوكساليك فى عروش بنجر السكر على نشاط الكائنات الحية وبعض المقاييس الأخرى بالكرش.

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تم إستخدام 12من الكباش الرحماني متوسط أوزانهم 62.4 كجم عند عمر 3 سنوات تقريبا من قطيع محطة التجارب والبحوث بالسرو لدراسة تأثير سيلجة عروش بنجر السكر غير المعامل او المعامل كيماويا او المعامل كيموحيويا بهدف التغلب على حمض الأوكساليك الضار الموجود طبيعيا فى عروش بنجر السكر. ففى هذه التجربة قسمت الحيوانات إلى أربعة مجاميع متساوية غذيت على أربعة علائق تجريبية كل وغذيت كل المجاميع على عليقة تحتوى على 50%علف مركز اضافة الى 50 % علف خشن حيث غذيت المجموعة الأولى على دريس البرسيم أما المجاميع الثلاثة الأخرى قد غذيت على واحد من انواع سبلاج عروش بنجر السكر كبديل لدريس البرسيم فقد غذيت المجموعة الثانية على سيلاج غير معامل , المجموعة الثالثة غذيت على سبلاج عروش بنجر السكر المعامل كيماويا و المجموعة الرابعة غذيت على سبلاج عروش بنجر السكر المعامل كيموحيويا وتم إجراء تقدير القيمة الهضمية وقياسات الدم وتقدير صفات سائل الكرش , اربع تجارب هضم اجريت لمدة 22 يوما , وأظهرت النتائج أن سيلاج عروش البنجر غير المعامل كان مرتفع معنويا بمستوى 0.05 فى محتواه من الألياف الخام وحمض الأوكساليك ومنخفض فى

البروتين والمستخلص الإثيرى والمستخلص الخالى الآزوت مقارنة بالمعاملات الأخرى ,وقد إنخفضت قيم السيلاج المعامل كيماويا وكيموحيويا من حيث المحتوى من NDF, ADF Hemicelluloses , Cellulose , ADL,إنخفاضا معنويا على مستوى 0.05 بينما إرتفعت كل هذه القيم مع سيلاج عروش البنجر غير العامل ومجموعة المقارنة. كما اوضحت النتائج أن سيلاج عروش البنجر غير العامل كان مرتفعا معنويا بمستوى 0.05 فى الأسيتات , والبيوترات والأيزوبيوترات بينما سجل السيلاج المعامل كيماويا وكيموحيويا أعلى قيمة فى محتواها من البربيونيك وأقل قيمه للنسبه بين الأستيك والبيوتريك و الفاليرات مقارنة بمعاملة السيلاج غير المعامل , كما إنخفضت الأمونيا والأحماض الكليه الطياره إنخفاضا معنويا فى مجموعة السيلاج غير المعامل متبوعه بمجموعة المقارنة خلال المراحل المختلفه . أما العدد الكلى للبكتريا والبكتريا المحلله للسيللوز و العد الكلى للبروتوزوا كانت مرتفعه معنويا فى السيلاج المعامل كيماويا وكيموحيويا خلال المراحل الزمنيه الثلاثه للتحليل مقارنة بمجموعة المقارنة وغير المعاملة , ومن ناحية أخرى وجد أن مجموعة السيلاج غير المعامل كانت أقل المجاميع المختبره فى محتواها من كرات الدم الحمراءRBCs , Monocyte , بينما إرتفع محتواها من كرات الدم البيضاء Eiosinophile, Lymphocyte , Neutrophile , creatinine, WBCs بينما انخفضت هذه القيم مع المجاميع الأخرى المختبرة .

قام بتحكيم البحث

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