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EFFECT OF CHEMICAL AND BIOCHEICAL TREATMENTS FOR SUGAR BEET VIEN SILAGE ON : II – REDUCTION OF OXALIC ACID CONTENTES TO IMPROVEMENT SUGR BEET SILAGE QUALITY AND NITROGEN UTILIZATION .

Saleh, M. R. M. ; G. I. Elemam and M. M. Refaay
Animal Production Res. Institute, Agric. Research Center ,Dokki, Egypt .

ABSTRACT

This work was designed to process sugar beet by-products treated and untreated on form of silage and trying to overcome harmful oxalic acid as anti nutritional factor to improving of sugar beet top by ensiling either untreated or treated sugar beet top by supplemented with calcium carbonate as chemical treated (CSBS) or calcium carbonate+ pro biotic as biochemical treated (Biochemical) .Four digestion trials were carried out using three rams in each .The animals were nearly equal in body weight 62.4±0.7 kg, and fed the experimental diets according to NRC(1990). group 1 fed 50% pellets+50% clover hay (CH) as a control , group 2 , 3 and 4 were fed 50% pellets+50% one of different types of silages .The effect of replacing clover hay by different types of treated or untreated sugar beet tops silage on DM intake, Digestion coefficient, nutritive values, nitrogen balance were studded. Also hematological parameters of white blood cells (WBC's) packed cells volume (PCV %) were also determined .

The results indicated that both of chemical and biochemical treated silage were excellent have a firm texture, good smell, free from sign of mold, dust smells caramelized and tobacco or vinegar . All silages had a normal of pH (3.98- 4.11) with the superiority of those biochemical treated silage 4.58. The over all mean of TVFAs ranged between (5.44- 7.29) ml mol / 100ml, being higher for treated silages. Bio-chemical treated silage recorded the least concentration of NH3-N (16.67gm/100gm) .The fast rate of pH decline with untreated silage, whereas the Biochemical treated silage was remained unspoiled and markedly improved aerobic stability of silage. Data showed that nitrogen balance are the best within B-CSBS than all tested treatments. The ensiling of sugar beet tops with additives depressed the presence of anti–nutrition factors. also results clearly that rams fed on treated ensiled were increased significantly ($p< 0.05$) the digestibility of OM ,CP,CF,NDF and ADL and improved significantly ($p<0.05$) TDN and DCP values. Ensilage of sugar beet tops with Biochemical had high advantages , improved the aerobic stability of silage and participate in feeding animals and minimize such problems of disposal pollution .

Keywords : Chemical, Biological treatments, nitrogen balance , Rahmany rams , packed cells volume , Digestion coefficient.

INTRODUCTION

In Egypt animal feed resources are limited which do not allow increasing livestock population to a level satisfies human demands. moreover feed shortage is also un evenly divided between summer and winter .where in winter season; berseem is the major forage crop covering nearly 46 and 125 % of yearly animal requirement of energy and protein, respectively Abou–Selim and Bendary,2005). While in summer season , the available feeds are mainly concentrate and straw which cover about 40%and 22 % the local animal requirements of energy and protein respectively confirm that

using crop wastes in animal diets could participate in reduce the shortage of animal feeds and subsequent increase milk and meat production .Chemical and biological treatments such as fungi (Abdelhamid *et al* .,2006 & 2007) as Trichoderma viride (Abdelhamid *et al*.,2009a,b&c) and penicillium *(fniculusms* (El- Ashry *et al*., 2003) were used to improve the nutritive value of nutrients especially crude fiber, in term of elevation of rumen microorganisms(Dawson,1992).and digestibility). (El-Serafy,1991But there are a problem of natural harmful oxalic acids contain because when you eat foods containing oxalic acid, this substance can interfere with the absorption of minerals in those foods, such as calcium, magnesium and potassium. Oxalic acid also can combine with minerals in the body, creating oxalate crystals that may cause problems for people prone to kidney stones or gout. The U.S. Department of Agriculture lists oxalic acid content in foods by parts per million (ppm), as compiled by Abdelhamid and Saleh (1998). The LD_{50} for pure oxalic acid is predicted to be about 378 mg / kg body weight, or about 22 g for a 60 kg human .The affinity of divalent metal ions is sometimes reflected in their tendency to form insoluble precipitates. Oxalic acid also combines with metals such as calcium , iron, sodium , magnesium, and potassium in the body to form crystals of the corresponding oxalates , which irritate the gut and kidneys . Because it binds vital nutrients such as calcium , long-term consumption of feeds high in oxalic acid can lead to nutrient deficiencies. Since many years noticed that some fungal species for production large amount of oxalic acid on moist straw , that mean the oxalic acid is one of mycotoxin , its produced by *A .flavus and A .niger* (Gredek ,1974 & 1983) .

The main objective of this study was to determine the influence of incorruption of different kind of silage made from sugar beet tops wastes on harmful oxalic acid and nutritive value by rams .

MATERALS AND METHODS

This study was carried out in El-Serw Animal Production Research Station,(Damietta governorate),Animal Production Research Institute , Agriculture Research Center Dokki , Giza, Egypt during June, 2008 .

Experimental animal rations and Management

To study the effect of feeding rams on the tested three different types of silage, four digestion trials were conducted on mature rahmany rams selected from El–Serw herd (3 animal each), with an average 62.4 kg weight, All rams were healthy and free of diseases .The rams (12 animals were divided randomly into four similar groups (according to body weight).Rams were housed in groups and kept under shade.

Experimental rations and feeding system

The experimental rations were therefore as :

Ration1- 50% CFM (pellets)+50%clover hay(control).

Ration 2 -50% CFM (pellets)+ 50 % untreated sugar beet top .

Ration 3 -50% CFM (pellets)+ 50% chemical treated sugar beet top .

Ration 4 -50% CFM (pellets)+ 50% biochemical treated sugar beet top .

Chemical analysis of ingredients and diets are presented in Table (1) feed allowance were calculated according to NRC1990 . Feed was offered two

times/day at 8 am and 3 pm.

Concentrate feed mixture

The formula of concentrate feed mixture pellets following : corticated cotton seed 17.0%, yellow corn 44 % , wheat bran 25 %, soy been meal (44% CP), 7% common salt 1.5% and 5% molasses .

Silage preparation

Fresh sugar beet tops which collected from El-Serw Damietta's government after harvested were chopped (10-15cm) by a hand machine and sun dried for a period of 3 days to reach a moisture content of about 65 –70 %, the silage was prepared by filling successive layers of the shopped materials and heavy trodden before adding the next layers .However, each layer was consisted of the sugar beet tops and chopped rice straw (4:1)molasses was added at the rate of 5% all silages were put in plastic bags for 8 weeks , then the bags were opened the color and odor were examined directly representative samples were taken from each kind of silage materials before and after ensiling for chemical analysis .

Untreated silage (USBS)

Whole wilted and chopped green sugar beet tops it mixed with 5% molasses was added during the silage making , then it. was ensiled in plastic bags for 2 month before feeding . After ensilage period , the color and odor were examined and samples were taken for chemical analysis determine silage quality.

Chemical treated sugar beet tops (CSBS)

Untreated silage Sugar beet tops were mixed with 3% calcium carbonate

Biochemical treated sugar beet silage (B-CSBS)

Chemical treated sugar beet tops was mixed with 1% pro biotic as biological treating.

Silage quality measurements

Samples from all types of silages (USBS , CSBS AND B-CSBS) were taken at the opening time and during the experimental period .The pH was measured using a digital pH mater, while ammonia concentration determined according to Conway (1962).The left of the filtrate was kept frozen at -20°C for TVFA determination according to Warner(1964) Lactic acid determined according to Waldo and Schultz (1996) .

Digestibility trials

Four digestibility trials were conducted using three adult rams for each to determine the digestion coefficients blood picture and analysis for the different treatments. Each trial lasted for 22 day the first 15 -day was considered as a preliminary period followed by 7 -days as a collection period .

Blood parameters

Blood profile was completed by estimations of some biochemical parameters in the blood serum for animals fed tested rations .Throughout the feeding period 8 am and 3 pm , blood samples were collected from each animal at early morning before feeding from the jugular vein into vacationer tubes. Hematological parameters including white blood cells (WBC′s) packed cells volume (PCV%) and hematology concentration. Whereas other samples were allowed to clot and centrifuged at 3500 rpm for 20 minutes to separated blood serum .serum was carefully decanted into labeled tubes using

serological pipettes and stored at 20°C until analysis.Total protein and albumin concentration were determined using commercially kits according to Douman *et al*.,(1971) .

Samples collection

At the last week of the experiment, faces and urine samples were collected daily for seven successive days from three animals for each group for nutritive values determination. Representatively samples of feed and fresh feces were dried and ground then mixed and kept for chemical analysis to estimator the nutrients digestibility. Urine was collected daily after mixed with 20 ml conc . Sulfuric acid to keep ammonia messed.

Analytical methods

Chemical analysis of feed ingredients and feces was carried out according to A.O.A.C. (2000) . oxalic acid was determined according to Fengwu *et al.,* (1999).Mycotoxins was determined according to modified model of (Abdelhamid and Saleh 1996) . Plasma biochemical analysis was done using Biomerieux reagent kits.Total volatile fatty acid(TVFA)of silage aqueous extract was measured by the methods of Patel and Mudgal (1974) .

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 analysis

Results in Table (1) showed the chemical analysis of the experimental feedstuffs and rice straw. Data showed that biological treated silage (B-CSBS) was higher in DM, CP, EE and NFE compared with other silages , whereas it was decreased in CF and ash .The values were 68.04 DM , 87.47OM , 14.89 CP , 7.61CF, 3.36 EE , 12.53 Ash and 57.62 NFE. Data indicated that USBS contain the lowest vales of DM , CP and EE. It was notice that the addition of effective microorganisms (probiotic)+ calcium carbonate during ensilage to CSBS and B-CSBS improved CP,CF and NFE, while decrease oxalic acid contents than those of USBS these results are in agreement with Mohsen *et al* .,(2006). Who found that silage making decrease CF and cell wall components, but increase EE and ash contents . Also Biomin (2008).mentioned that inoculants lead to higher production of lactic acid and therefore lower pH value, decrease butyric acid fermentation or inhibition of the clostridia fermentation and a higher recovery of energy in the ensilage matter . Bendary *et al* ., (1992 a & b) who indicated that sugar beet tops (SBT)as fresh ,dried 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 use fresh sugar beet tops because it has contain of natural harmful oxalic acid which causing kidney , liver and hart disease(Saleh *et al* .,2008) .on the other side all results obtained indicated that sugar beet tops(SBT)as fresh, dried or silage made by different

methods had high feeding value and more palatable compared to other field west(Abdelhamid and El-Emam ., 2001) . Decreasing of crude fiber of B-CSBS may be due to the effect of the librations of cellulose formats bonds with lignin(delignification which increased solubility(Abd El- Hamid and saleh.,1989).This result agreed with Chauhan and Kakkar(1981).and Zedan (1998).Similar results have been reported with urea treatment of rice straw , corn Stover sugarcane tops at ensilaging(Abd El–Aziz,1993 Talha 1990;Tabanah 1994 ,Chauhan ,1994 and Abd El-A ziz,*et al*.,1997) .subsequent there are Similar results were reported by Mohamed (1998& 2003).who found that treatment corn Stover silage with1%urea and 3% molasses at ensiling decreased its NDF, ADF and ADL contents .

Table (1): Analysis of ingredients, different types of silage and experimental diets .

items	pallets	BH	RS	Experimental rations on (DM bases)			
				COTROL	UTSBS	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	81.56	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	15.26	18.45	12.53
NFE	61.18	47.23	44.13	56.09	54.51	50.82	57.62

Oxalic acid

Oxalic acid is very harmless for human and animals because it causing kidney and liver damage. Abdehamid and Saleh (1998). People with recurrent kidney stones have a tendency to absorb higher levels of dietary oxalates compared to those not prone to kidney stones. Data of oxalic acid, Table(2). Clearly that USBS group was higher significant difference($p<0.05$) than CSBS and B-CSBS groups , whereas B-CSBS recorded lower value of oxalic acid and this may be due to bicarbonate and pro biotic supplemented to silage among silage making .This results agree with that obtained by Abelhamid and El-emam (2001). A low-oxalate diet is eating foods containing less than 50 mgs of oxalic acid per day. Saleh (1999). Oxalic acid also combines with metals such as calcium , iron, sodium , magnesium, and potassium in the body to form crystals of the corresponding oxalates , which irritate the gut and kidneys . Because it binds vital nutrients such as calcium, long - term consumption of feeds high in oxalic acid can lead to nutrient deficiencies.

Table (2):Oxalic acid contain in diets, feces and mg/100(gm/or ml).

Items	Oxalic acid µg / 100 gm or ml		
	USBS	CSBS	B-CSBS
Diets	9.82a	3.95b	3.87b
Feces	2.67a	0.86b	0.74b
Urine	4.21a	1.73b	1.51b
rumen liquor	7.21a	1.58b	1.19b
Blood	2.48a	0.70b	0.28b
Total excretion	6.88a	2.59b	1.05b

Means having different superscripts within the same row are significantly different at P<0.05 .

Mycotoxins

Data in Table (3). Clearly that Aflatoxin $_{B1}$ and ochratoxin $_{A}$ were adjust absence in both chemical and bio- chemical treated silage , whereas the values of aflatoxin B1 and ochratoxin A with Untreated sugar beet silage were 13.72 and 76.8 ppb for aflatoxin $_{B1}$ and ochratoxin $_{A}$ respectively .this may be bach to calcium bicharbonat and probiotic supplemented to silage .subsequent the aflatoxin B1 and ochratoxin$_{A}$ impair liver and kidney function , delay blood clotting,increase susceptible to bruising,and interfere with cellular humoral immune system(Diekman and Green ,1992) as well as suppression of cellular immunity(Qureshi *et al* .,1998).So, inhibition of DNA , RNA and protein synthetic via a variety of different mechanisms appears to be directly or indirectly responsible for the immunosuppressive action of many mycotoxins(Correr 1991).Studies have linked human exposure to Aflatoxins to increase prevalence of infection(IARC,2002).Its chronic symptoms include liver and kidney damage , reduced growth , anemia , bruising and immune suppression(Heman and Ttigo – Stockli 2008).The biochemical effects of aflatoxins included carbohydrate metabolism, endocrine system,and skeletal system(Verma ,2007)as well as DNA damage (El- Barbary , 2008) . Mycotoxins are found frequently in different feedstuffs (Sawamy 2009). And treat not only plant crops , but also animal and human health . El-Shenawy *et al* .(2005) .

Table (3): Mycotoxins Aflatoxin$_{B1}$ (AF$_{B1}$)and Ochratoxin$_{A}$ (ON$_{A}$) ppb/kg .

Items	control	Oxalic acid ng / 100 gm or ml		
		USBS	CSBS	B-CSBS
Aflatoxin $_{B1}$ ppb / kg	81.7a	13.72b	-	-
Ochratoxin $_{A}$ ppb/ kg	126.3a	76.8b	-	-

Means having different superscripts within the same row are significantly different at P<0.05 .

Hematological and Biochemical parameters

Data of some hematological parameters of the blood collected from animals feed the tested rations are presented in **Table (4).**There were significant differences (p<0.05) decrease in erythrocyte and leucocytes for USBS compared with B-CSBS , CSBS and control groups. On the other hand the neutrophile , lymphocyte % and eiosinophile were significantly increased

(p<0.05) with USBS group, whereas 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 decreases of protein than the B-CSBS , CSBS and control groups. Addition to that oxalic acid have an enhancement effect to the humoral immune response and increase white blood cells (Pollman *et al*., 1980).

Table (4): Blood picture of rams fed different type of sugar beet tops silage

Items	Control	Sugar beet tops		
		USBS	CSBS	B-CSBS
Hematological parameters .				
Hematocrit values (%)	18.5	22.34a	16.97b	15.76c
White blood cells(x103/ mm3)	6.09b	7.41a	6.43b	6.19b
Lymphocyte (%)	56.11b	62.97a	57.98b	57.3b
Neutrophile (%)	43.43b	58.76a	42.53b	41.8b
Eiosinophile (%)	5.34b	7.14a	4.87b	4.7b
Monocyte (%)	17.66b	15.12c	22.16a	21.9a
Biochemical parameters .				
AST(u / ml)	64.0a	71.23a	23b	16.00b
ALT(u / ml)	54.0a	49.27a	14b	11.83b
Creatinin (mg /100ml)	0.94a	1.18a	0.27b	0.33b
Bilirubin (mg /100ml)	0.52a	0.68a	0.29b	0.23b
Alk-P-ase (lu / l)	76.4a	96.57a	18.23b	11.55b

Means having different superscripts within the same row are significantly different atP < 0.05 .

Nitrogen utilization

Results concerning nitrogen intake , excretion and balance are presented in Table(5) .Nitrogen balance (g /h /d) was positive in all tested groups fed the experimental rations indicated that the animal were in normal N metabolism status , a condition necessary for accurate evolution of the tested rations . The highest values of NB was found in B-CSBS and CSBS this may be attributed to presence of treated silage in rations (El - Kady *et al* ., 1999).

This result indicated that effective microorganisms before ensilage process particularly with biochemical treatment was improved nitrogen digestion as a percentage of intake (62.00, 55.46, 50.93 and 54.59% for B-CSBS ,CSBS, USBS and control, respectively).This result is agreement with the finding of (Saleh *et al*., 2007) and (Bendary *et al* ., 1992 a) .

Table (5): Nitrogen utilization of rams fed on different sugar beet top silage .

ITEMS	Control	USBS	CSBS	B-CSBS
Nitrogen intake mg / kg BW	75.48b	68.05a	71.64a	74.49a
Feces nitrogen mg / kg BW	17.89b	19.06a	15.26c	14.89c
Urine nitrogen mg / kg BW	16.38a	14.33b	16.65 b	13.42b
Total nitrogen excretion mg/kg BW	34.27a	33.39a	31.91a	28.31a
Digestion nitrogen mg / kg BW	41.21c	34.66b	39.73 b	46.18a
Digestion nitrogen of nitrogen intake	54.59b	50.93b	55.46 b	62.00a

Means having different superscripts within the same row are significantly different at P < 0 .05 .

Silage quality

silage pH

The pH values in Table (6) were 4.4.39, 4.11 and 3.98 for CSBS , USBS and B-CSBS respectively .The data showed that the pH value were decreased for B-CSWS .This agreement with the result obtained by Austin (1997) who found a high significant correlation between Urea supplemented to silages and pH value. The Ph value is an important criteria of the B-CSBS which reflected the change occurred during ensilage. at the same time, it is considered the simple method to predict the silage quality The fast rate of pH decline with silages imply quick establishment of anaerobic condition in the container , which in turn promote a growth of lactic acid and minimize time of ensilage by about tow weeks .These results are in agreement with those obtained by Yacout (2001) found that pH value of all silage reached a plateau between 3.85 and 4.20 with a trends lower pH value with treated silages which indicated good silage fermentation.

Lactic acid concentration

Lactic acid concentrations were 4.28, 4.62 and 5.23 for USBS,CSBS and B-CSBS respectively Table (6) . The USBS was lower value of lactic acid concentration compared to other B-CSBS and CSBS silage . The results was indicated that addition of molasses to B-CSBS and CSBS through ensilage Process inhibits lactic acid formation even mach carbohydrates are available as molasses. These results are in agreement with those of Chauhan(1994). who reported that the chemical and biochemical treated silage was higher in lactic acid concentration than untreated silage. Good quality silage characteristics was related a high level of lactic acid (Barnet,1954) .Mohamed (1998) and Tabanah (1994) indicated that the pH values had an inverse trend to lactic acid production .The soluble carbohydrates are major source for lactic acid production , which improved the silage quality .

Total volatile fatty acid concentration (TVFA) .

The contents of TVFA Table (6) are used for judging silage quality .Results indicated that TVFA concentrations of silage ranged between 5.44,6.76 and 7.29 ml mol / 100 ml by week 8 for USBS , CSBS and B-CSBS respectively .The total TVFA values tende d to be higher with inculcated silage .The higher quality is characterized by high TVFA concentration (Etman *et al* 1994) .

NH3 – N concentration

Results in Table (6) .Showed that ensilage NH3-N concentration of the three types of silages ranged between 18.54 ,22.41and 16.76 mg /100 gm with a tendency to be lower with untreated silage than treated silage . The protein breakdown is almost inhibited with decreasing pH value , this might be due to that lactic acid organisms help to reduce the breaking of protein to ammonia (Vertanin, 1984) .This results are in agreement with the feeding of Hieu (1999) .

Physical properties

The most important physical properties of silage quality are the silage smell and color the silage was excellent with a nice smell and a bright greenish-yellow color , which turned brown when exposed to air . In addition some juice were collected at the bottom of the sugar beet tops silages(SBS)

which contained molasses. The color tended to be brown in the sugar beet tops silage ,Hughes and Peralta(1981) .in sugar with N bases via the Millard action . Hughes and Peralta (1981) observed that the SBT silage become a dark brown color with urea treatment.

Table(6): Fermentation characteristics of different type of silage (on dry matter basis) .

Item	UTS	CSWS	BCSWS
The pH value	4.39	4.11	3.98
Lactic acid (mg/100g)	4.28	4.62	5.23
Total volatile fatty acid (TVFA's) ml mol / 100 ml	5.44	6.76	7.29
Ammonia-N (mg/100gm)	18.54	22.41	16.67
Total count of microorganisms , cfu/g	5.9x 105	6.8x 107	7.5 x108

Digestion trials

Feed intake

daily dry matter intake by rams fed either control diet (CFM) or treated silage diets (USBS , CSBS and B-CSBS) in Table (7) . The results were indicated that the daily DMI of rams fed UBS was higher (p< 0.05) than those fed CSBS , BCSBS and control .The values were 2316 , 2952 , 2747, 2460g / h / d for USBS , CSBS and B-CSBS, respectively .

Nutrient digestibility and feeding values

Data in Table (8) clearly indicated 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 higher (p<0.05) for NDF, ADF ADL , cellulose and hemicelluloses than other all treatments. This result may be due to the microorganisms and urea supplemented during ensilage and decreasing the level of oxalic acid .

Table (7): Daily feed intake by rams fed on the different silage of Sugar beet tops .

ITEMS	diet	DM (g/h/d)	DM (g/kg ^{75})	DM (%of Bw)
Control	CFM	1260	211.48	1.23
	BH	1056	105.25	0.61
	TOTAL	2316c±49	338±92	1.84±40.3
USBS	CFM	1278	214	1.16
	USBTS	1674	262	1.41
	TOTAL	2952a±28	476±5.7	2.57±0.04
CSBS	CFM	1080	189	0.88
	CSBTS	1667	261	1.21
	TOTAL	2747a±39	441±12	2.05±0.03
B-CSBS	CFM	1215	206	0.84
	BSBTS	1245	235	0.95
	TOTAL	2460b±18	441±10	1.79±40.01

Means having different superscripts within the same column are significantly different at P<0 .05 .

Table (8): Digestion coefficients and feeding values (% on dry matter bases) of different silages fed to Rahmany rams .

ITEMS	Control	USBS	CSBS	B-CSBS
s digestibility %				
DM , %	64.78±1.91a	62.43±2.47b	65.34±2.12a	67.23±2.19a
OM , %	62.40±1.18b	60.94±1.08c	64.84±0.6b	68.37±0.8a
CP , %	65.97±2.37b	61.37±1.44c	65.44±0.75b	71.11±0.69a
C F , %	55.41±1.38b	49.34±0.67b	61.71±0.79a	66.97±0.94a
EE , %	67.15±2.21a	63.85±1.37b	66.34±0.58a	69.38±2.32a
NFE , %	68.25±1.63a	61.17±1.97b	63.35±1.32b	67.57±2.15a

Means having different superscripts within the same row are significantly different at P<0 .05 .

CONCLUSION

From the foregoing results it could be concluded that effective microorganisms and calcium sources as an additives for making silage of sugar beet tops was effective and closely from the view point of economy even concerning feed conversion which was statistically similar to the control .So it to recommended using sugar beet tops silage with effective microorganisms and calcium sources + urea in feed ruminants without any harm effects on feed utilization and animal health , but to overcome, to some extent , the gap in animal feed stuffs by introducing sugar beet tops silage as a feed resource in the economical animal production .

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تأثيرالمعاملات الكيماوية والكيموحيوية لعروش بنجرالسكر على:
II – تقليل المحتوى من حمض الأوكساليك وتحسين جودة السيلاج لزيادة الإستفادة من أزوت العلائق.

مصطفى راشد محمد صالح و جمال ابراهيم الامام و محمد مصطفى رفاعى .
معهد بحوث الإنتاج الحيواني – مركز البحوث الزراعية – دقي – مصر .

صممت هذه الدراسة لمعاملة عروش بنجر السكر المحفوظ على صورة سيلاج غير معامل او معامل كيماويا اوكيموحيويا لمعرفة تأثيرهذه المعاملات على المحتوى الضار الطبيعى من حمض الأوكساليك والقيم الغذائية من مادة جافة والمأكول و معاملات الهضم وميزان النيتروجين والمكونات الأساسية لكرات الدم البيضاء والسموم الملوثة لهذه المخلفات الحقلية على الكباش الرحمانى التامة النمو . اجريت أربع تجارب بمحطة بحوث الانتاج الحيوانى بالسرو – مركز البحوث الزراعية على الكباش الرحمانى عمر 3 سنوات تقريبا ومتوسط وزنها 62.5كجم ، قسمت عشوائيا إلى أربعة مجاميع متساوية (3حيوانات بكل معاملة) . غذيت الحيوانات حسب الاحتياجات وفقا لمقررات(الـ إن آر سى 1990)50 كالأتى : 50% مركزات على صورة مصبعات + 50 % دريس برسيم (مجموعة مقارنه) أو واحد من انواع السيلاج سواء غير المعامل أو المعامل كيماويا او كيموحيويا بالمعاملات التجريبيه الثانية والثالثة والرابعة. وقد وقد أوضحت النتائج أن كلا من السيلاج المعامل كيماويا وكيموحيويا كان يمتاز بالقوام والرائحة الجيدة وخلوه من الفطريات والأتربة وتميزه برائحة حمض اللاكتيك المنفردة للسيلاج ، كما اظهر التحليل الكيماوى لكل أنواع السيلاج غيرالمعامل أو المعامل أن السيلاج المعامل كيموبيولوجيا كان مرتفع معنويا فى محتواه من المادة الجافه، البروتين الخام ، المستخلص الإثيرى مقارنة بباقى المعاملات بينما انخفض محتواها من الألياف الخام و الرما د . كما أشارت النتائج أن جميع أنواع السيلاج المعامل كيموحيويا كانت ذات درجة حموضة طبيعية (4.11 – 3.98) مع تفوق السيلاج المعامل كيموبيولوجيا (3.98) . وقد تراوح متوسط الأحماض الدهنية الطيارة بين (5.44- 7.29) مللى مول / 100مللى – وكان منافعا مع السيلاج المعامل . وقد سجل السيلاج المعامل كيموبيولوجيا اقل تركيزمن أزوت الأمونيا (16.67 مللى جرام/ 100 جرام). كما اظهرالسيلاج غير المعامل انخفاضا سريعا فى درجة الحموضة بينما بقى السيلاج المعامل كيموبيولوجيا غير متعفن وقد أظهرتحسنا ملحوظا وثباتا عند تعرضه للهواء .كما اظهرت النتائج أن ميزان الأزوت كان الأحسن مع السيلاج المعامل كيموبيولوجيا مقارنة بلأنواع الأخرى . وقد أدت السيلجة مع ا لإضافات الى تخفيض وجود العوامل المضاده للتغذية – وأظهرت النتائج أن الكباش التى غذيت على سيلاج معامل زيادة معنوية فى معاملات هضم المادة العضوية ، البروتين الخام ، الألياف الخام و الـ (إن دى إف ، إيه دى إل)وأدت إلى تحسين معنوى فى قلم المركبات الكليـة المهضومة والبرونين الخام المهضوم.
وتخلص النتائج إبى أن سيلجة عروش البنجر مع الكيموبيولوجى لها مميزات تحسين الثيات الهوائى للسيلاج مع المساهمــه فى تغذية الحيوانات وتقليل التلوث البيــئى .

قام بتحكيم البحث

أ.د / محمد محمد الشناوى — كلية الزراعة – جامعة المنصورة
أ.د / محسن محمود شكرى — المركز القومى للبحوث