J. Agric. Sci. Mansoura Univ., 28(4): 2609 - 2619, 2003

PRODUCTIVE PERFORMANCE OF BUFFALO CALVES AS AFFECTED BY USING CONSERVED GREEN FORAGES: 1- EVALUATION OF DIFFERENT TYPES OF CONSERVED GREEN FORAGES AS SILAGE AND HAY .

Lashien. M. E. *; Soheir M. Zeidan and H. S. Ali **.**

*** Department of Animal Production, Faculty of Agriculture, El-Azhar University, Cairo, Egypt.**

****Animal production Research Institute,Dokki, Giza , Egypt.**

ABSTRACT

Twelve male buffalo calves were used in four digestibility trails, (3 animals each) averaged 359.25 kg LBW to evaluate nutrient digestibility and nutritive value of rations containing 70% concentrate mixture and 8.1% rice straw with *ad lib* one of conserved green forages as maize stover silage (MSS), whole maize silage (MS), berseem silage (BS), and berseem hay (BH).

Results showed that different kinds of green forages produced a good quality silages with suitable fermentation. All tested silages had a normal values of pH (3.9 to 4.4), NH_3- N (0.19 to 1.27 mg/g DM) and Total VFA's (1.50 to 1.93 mlmol/100ml). Dry matter intake of tested silage and hay rations ranged between 11.077 to 12.101 kg/head/day with no significant differences. The digestion coefficients of DM, OM, CF and Ash tended to be significantly higher ($P<0.05$) with MS and BS silage rations than those for MSS silage ration and BH silage ration. However, CP digestibility for BS silage ration was significantly ($P<0.05$) higher than with other rations. It was noticed also that, all nutrient digestibilities of BH ration were quite similar (except EE digestibility) when compared with MSS silage rations. Nutritive values as SE and TDN recorded the highest with MS and BS silage rations, the differences were significant. On the other hand, the digestable crude protein values (DCP%) of MS and MSS silage rations were significantly ($P<0.05$) lower than those for berseem silage or berseem hay rations. At most of sampling times ruminal pH values, ammonia-N and TVFA's concentrations tended to be higher with MSS silage rations.

Keywords: buffalo, silage, berseem hay, nutritive value, rumen function.

INTRODUCTION

In Egypt, the main causes of poor performance of buffalo calves in summer season may be attributed to the shortage in animal feedstuffs especially in green forage. This shortage related to the limited cultivated area to food production. Preserving excess amounts of green forage as silage for summer season may be helpful to reduce feed shortage (Mahmoud et al. 1992). Total digestible nutrient yield is 50% more when maize is harvested as silage compared with harvesting as grain. Also, more than 90% of the nutrient produced in corn silage that made from whole crop plant with ears are saved (Ensminger et al., 1990). There is less wastage of feed when silage is fed compared with feeding dry feedstuffs and feeding process lands itself to automation (Perry and Cecava, 1995). The present investigation was undertaken to study the effect of using different types of silage such as maize silage (MSS), whole plant maize stover silage (MS), berseem silage (BS) and

berseem hay (BH) in buffalo rations on digestion coefficients, nutritive value and rumen functions.

MATERIAL AND METHODS

Ensiling of green forages :

This study was conducted at Mahallet Mousa, Buffalo Experimental Station (APRI). Three kinds of forage were used including maize stover, whole plant maize with ears and berseem 1st cut (*Trifolium alexandrinum*). Maize stover (MSS) was immediately collected after harvesting in high moisture stage (65.70 %) of maturity to prevent spoilage losses (Montgomery *et al* 1973). Maize stover silage was prepared by adding of 0.5% urea (46%N) with 2.5% diluted molasses (on fresh basis), after chopped into 2-2.5 cm of length, then ensiled with a good pressed in trench and covered with plastic sheet, then by thin layer of rice straw with 30 cm thick soil layers. Also, Whole plant maize (with ears) (MS) was chopped (2 to 2.5 cm lengths) after harvesting at dough stage of maturity and ensiled like maize stover without any addition. Berseem (*Trifolium alexandrinum*) (BS) at 1st cut was wilted for three days on the field before ensiling to adjust its DM content and 50kg ground maize was added per ton of wilted berssem and ensiled as previous prosess of maize stover. After 6 months (storage period), the silages were removed from the trench by cutting vertically a suitable area with an axes. The daily quantities of silage were offered to buffalo calves after removing spoiled silage. Samples of fed silage were obtained daily to evaluate silage quality as pH value,VFA's content and NH_3-N concentration . The chemical composition of experimental feeds and rations are shown in Table (1).

Table (1): Chemical analysis of experimental feeds and ration (on DM basis %)

Item	DM%	CP%	EE%	CF%	NFE%	Ash%	OM%
Maize stover silage (MSS)	32.57	5.79	1.43	31.3	48.1	13.38	86.62
Maize silage (MS)	33.68	7.84	3.2	21.03	59.33	8.6	91.4
Berseem silage (BS)	28.95	14.23	3.82	25.65	43.49	12.81	87.19
Berseem hay (BH)	91.22	12.57	2.55	24.52	46.67	13.69	86.31
Concentrate feed mix ture	90.35	16.96	4.61	18.2	53.46	6.77	93.23
Rice staw.	88.78	2.8	1.85	39.5	37.24	18.61	81.39
Experimental ration:							
MSS ration	7.57	14.02	3.41	22.79	50.97	8.81	91.19
MS ration	7.80	13.80	4.30	18.82	54.74	8.34	91.66
BS ration	6.82	15.20	4.20	21.56	49.97	9.07	90.93
BH ration	9.88	14.85	3.93	21.31	50.65	9.26	90.74

Digestability coefficients :

Twelve buffalo male calves (359.25 Kg body weight in average) were used with digestibility trails in four groups (3 in each), to determine digestion coefficients, the nutritive values, and rumen functions of teasted rations. Animals were fed according to Shehata allowances, (1970) by 70% concentrate mixture (CFM) and 30% of teasted silage or hay (21.9%) with rice straw(8.1%). The digestibility trial groups were as follow: MSS group, fed on treated maize stover silage, Ms group, fed on maize silage, BS group, fed on berseem silage, and BH group, fed on berseem hay. Concentrate feed mixture was composed of 35.5% wheat bran, 31.5% undecorticated cotton seed cake, 15% yellow corn, 10% sun flower seed cake, 3.5% vinaes, 3% limestone and 1.5% salt. Each trail lasted 21 days, the first 14 days were considered a preliminary period followed by 7 days as collection period.The teasted silage rations and berseem hay ration were offered twice daily at 8 am and 4 pm. Water was available at all times . Acid Insoluble Ash method (A.I.A.) was used as an internal marker to determine the nutrient digestibility according to Van Keulen and Young (1977). Total fecal samples were collected from the rectum every 24-hour twice daily for successive days collection period using metabolism cages. Chemical composition of rations and samples of feces were prepared for chemical analysis according to A.O.A.C.(1980). Rumen liquor samples were taken individually from three calves at five times (0,1,2,4 and 8 hours) for two consecutive days. The pH values were measured immmediately , then the liquor was strained through four layers of cheese clothes for determination of Ammonia-N concentration according to Con-Way methods (1957). Also total VFA's concentrate and its individual were determined by Abou-Akkada and El-Shazly (1964). Rumen protozoa count was taken as cited by El-Saifi (1969). Statistical procedures were carried out using the general linear model program of SAS (1988).

RESULTS AND DISCUSSION

Physical and fermentation characteristics of silage:

Table (2) illustrate the characteristics of silage fermentation and VFA's fractions. All different kinds of silage had a pleasant aromatic smell, natural color and pleasing test. The pH value ranged between 3.9 to 4.4, which were within the normal range, (McDonald *et al.*, 1995). Slightly decrease was observed in pH value for MS than those in MSS and BS silage. The differences in pH values among silages may be related to the differant content of soluble carbohydrate (Table 1) and to reduction of the anaerobic microorganisms activity when pH value below 4.0, (Nadra *et al.*, 1985; Etman *et al.* 1994 and Bendary *et al.* 2001b). High quality of MS silage is characterized with low NH_3-N concentrate compared with MSS and BS silage. Good quality silage was obtained when NH_3-N less than 10% of total N, (McDonald *et al* 1995). Increasing of NH_3-N concentration in MSS silage may be due to adding urea through ensiling period. While BS silage has slightly lower lactic acid than MSS and MS (1.6 vs. 1.81 and 1.83 ml moll/100ml, respectively), similar results was obtained by Etman *et al.* 1994 and Khinizy *et al.*, 1997. Total VFA's concentration in all kinds of experimental silage ranged

between 1.5 to 1.9 ml moll/100 ml silage extracted. It was noticed also,that total VFA's concentration for BS was lower compared than those with MS and MSS silage (1.5 vs. 1.93 and 1.70 ml moll/100), this may be attributed to reduction of DM content for BS than MSS and MS silage (Etman *et al.*, 1994 and Bendary *et al.* 2001a). It can be noticed that MS silage was the best quality silages as it increased total VFA's and lactic acid concentrations while decreased pH values and ammonia nitrogen compared with those in the BS and MSS silages.

Feed Intake:

The average daily intakes of buffalo fed experimental rations are presented in Table (3). The study revealed that daily DM expressed as kg/h/d was not affected by source of conserved forage, it ranged from 11.077 to 12.101 kg. The differences among the experimental rations were not significant. The same trend was obtained with DM intake expressed as kg/kg $w^{0.75}$

Table (2): Fermentation characteristics and percentages of VFA's fractions of the tested silages.

Items	MSS silage	MS silage	BS silage
pH value	4.1	3.9	4.4
Ammonia-N mg/g DM	1.27	0.19	0.23
Lactic acid ml mol/100ml	1.81	1.83	1.6
VFA's fractionations as (%) of fresh basis:			
Acetic acid	0.71	1.01	0.99
Propionic acid	0.02	0.07	0.03
A/P	35.50	14.43	33.0
Valeric acid	0.52	0.15	0.28
Isovaleric acid	0.16	0.07	0.07
Butric acid	0.04	0.17	0.04
Isobutric acid	0.25	0.46	0.09
Total VFA's ml mol/100ml	1.70	1.93	1.50

Digestion coefficients and nutritive value:

Table (3) showed that DM and OM digestabilites in all kinds of silage were ranged from (60.94 % to 70.34 %) and from (64.4 % to 71.54 %), respectively, while it were 60.69% and 64.62% with berseem hay ration. DM, OM, CF and Ash digestibility tended to increase significantly ($P<0.05$) with MS and BS silage rations than that in MSS silage. On the other hand, CP digestibility of BS silage ration was significantly ($P<0.05$) higher than those fed MSS and MS silage and hay rations, respectively, these results may be

due to a variation in crude protein contents in the rations and protein quality and solubility. The digestion coefficient of NFE was high and quit similar to MS and BS silage rations while, NFE digestibility for MS ration was lower than other ration witout significant differences among them. Berseem hay ration had the lowest significant (P<0.05) values of nutrient digestibilities except NFE% and EE% when compared with those obtained for MS and BS silage rations. On the other hand, nutrient digestibilities of BH ration were quite similar (except EE digestibility) to that of MSS silage rations.

Table (3): Average daily feed intake, digestion coefficients and nutritive values of Buffalo male calves fed tested rations.

Items	Rations			
	MSS	MS	BS	BH
Av. daily DM intake : (kg/h/d): Concentrate mixture (CFM)	6.897	7.347	7.707	6.63
Rice straw	1.73	1.88	1.897	1.473
Silages	2.450	2.587	2.497	-----
Berseem hay (BH)	------	-----	-----	3.304
Total DM intake (kg/h/d)	11.077	11.814	12.101	11.143
Total DM intake (kg/kg $W^{0.75}$)	0.133	0.146	0.145	0.136
Digestion Coefficients % :DM	62.99± 0.50 ^{b}	69.61± 0.57 ^{a}	70.34± 0.45 ^{a}	60.69± 2.04 ^{b}
OM	64.48 ± 0.51 ^{b}	71.31±0.80 ^{a}	71.54±0.44 ^{a}	64.62±0.41 ^{b}
CP	67.08± 1.22 ^{c}	73.78±0.40 ^{b}	77.28± 0.41 ^{a}	69.84±0.68 ^{c}
EE	79.16± 1.21 ^{b}	88.39±0.48 ^{a}	85.73±0.90 ^{a}	86.36± 2.20 ^{a}
CF	68.35 ± 0.68 ^{b}	73.81±0.88 ^{a}	73.30±0.56 ^{a}	66.67± 0.38 ^{b}
NFE	42.56±17.84 ^{a}	67.56±0.47 ^{a}	67.86±0.60 ^{a}	60.59± 0.64 ^{a}
Ash	48.53± 6.30. ^{b}	56.49± 1.05 ^{a}	59.43±0.98 ^{a}	44.89 ± 3.58 ^{b}
Nutritive values %:SE	50.82±0.41 ^{c}	55.22±0.19 ^{b}	57.20±0.54 ^{a}	52.06±0.45 ^{c}
TDN	62.07±0.48 ^{b}	68.07±0.55 ^{a}	68.85±0.50 ^{a}	61.99±0.34 ^{b}
DCP	8.22± 0.17 ^{c}	8.51± 0.10 ^{c}	10.31±0.14 ^{a}	9.12± 0.15 ^{b}
DCP : TDN ratio	7.56±0.17 ^{b}	8.00±0.14 ^{a}	6.68± 0.05 ^{c}	6.80± 0.05 ^{c}

a,b, c Means with different superscripts in each column differ significantly (p< 0.05).

Nutritive value as SE and TDN % were significant (P<0.05) higher for MS and BS silage rations than those of MSS and BH rations, it may be due to the high digestibility of most nutrients (Table 3). These results were in agreement with those obtained by Mostafa *et al.*,(2000) who obtained that TDN and SE values were significantly higher with MS silage than maize stover silage treated with urea (MSS). However, the DCP values of MS and MSS silage rations were significantly (P<0.05) lower than those fed berseem silage or berseem hay. DCP to TDN ratio was ranged from (6.68-8.00). The

differences were highly significant (P<0.05) with MS ration followed by MSS silage ration.

Rumen function:

The statistical analysis of pH value revealed that there was no significant difference among tested rations at different time of sampling except at 4hr post feeding. The recorded pH values were highest for all experimental rations at pre feeding (0hr) (Figure 1). Afterwards, pH values for all groups, decrease gradually till reach to the minimum pH values at 4hrs post feeding, this r easult w as a greed w ith t hose o btained b y (Khalifa, 1 972; Etman *et al.* 1974 and Sahfie *et al.*, 1982), then pH value was slightly increased at 8hrs post feeding for all experimental animals (Carro *et al.* 1994). The highest pH value was recorded with BH ration followed by MSS ration, while, the lowest was for MS ration at different sampling times. However, NH_3-N concentration was significant (P<0.05) increased after feeding to reach its maximum value at 4hrs post feeding then tend to significant (P<0.05) decrease at 8hr for all groups. It could be noticed also,that the NH_3-N concentration was the highest value with calves fed MSS ration at all sampling time followed by those fed MS and BS ration, while the lowest value was recorded with those f ed B H ration, (Figure 1).However,supplemented u rea a nd m olasses d uring e nsiling MSS tended to increased (P<0.05) NH_3-N in rumen liquor than other groups, this may be attributed to increase source of nitrogen and energy, (Mahmoud *et al.*, 1998 and Ali and Sorenson, 1979).

Similar trend was observed with TVFA's at all the sampling time. Minimum level was noticed at pre-feeding and optimal level was reached at 4hr post feeding, which declined at 8hr with all calves. T he lowest level of TVFA's was obtained with MS ration at 2hr than other rations (10.7 mg/100ml), while MSS ration was the highest value (Figure 1). This result agree with those obtained by El-Ayouty, (1976); Sahfie *et al.*, (1982) and Deraz, (1996). No significant differences were detected among the tested rations in TVFA's concentration except at 2hr, the differences between MSS and MS ration was significant (P<0.05).

The volatile fatty acids (VFA's) fractionations are shown in Table (4), the optimal acetic acid values were observed at zero time of sampling for experimental groups, and gradually decrease to the maximize rate at 2hr after feeding then increased again. While propionc and butric acids reach the minimum level before feeding and increase after feeding to the maximum at 2hr ,then, became low in all experimental ration. This may be due to the relationship between microorganism and pH value (Delcurto *et al.* (1990). Meanwhile, the overall means of acetic propionic ratio (A/P) were high in MSS ration than the other rations (Black *et al.*, 1987).

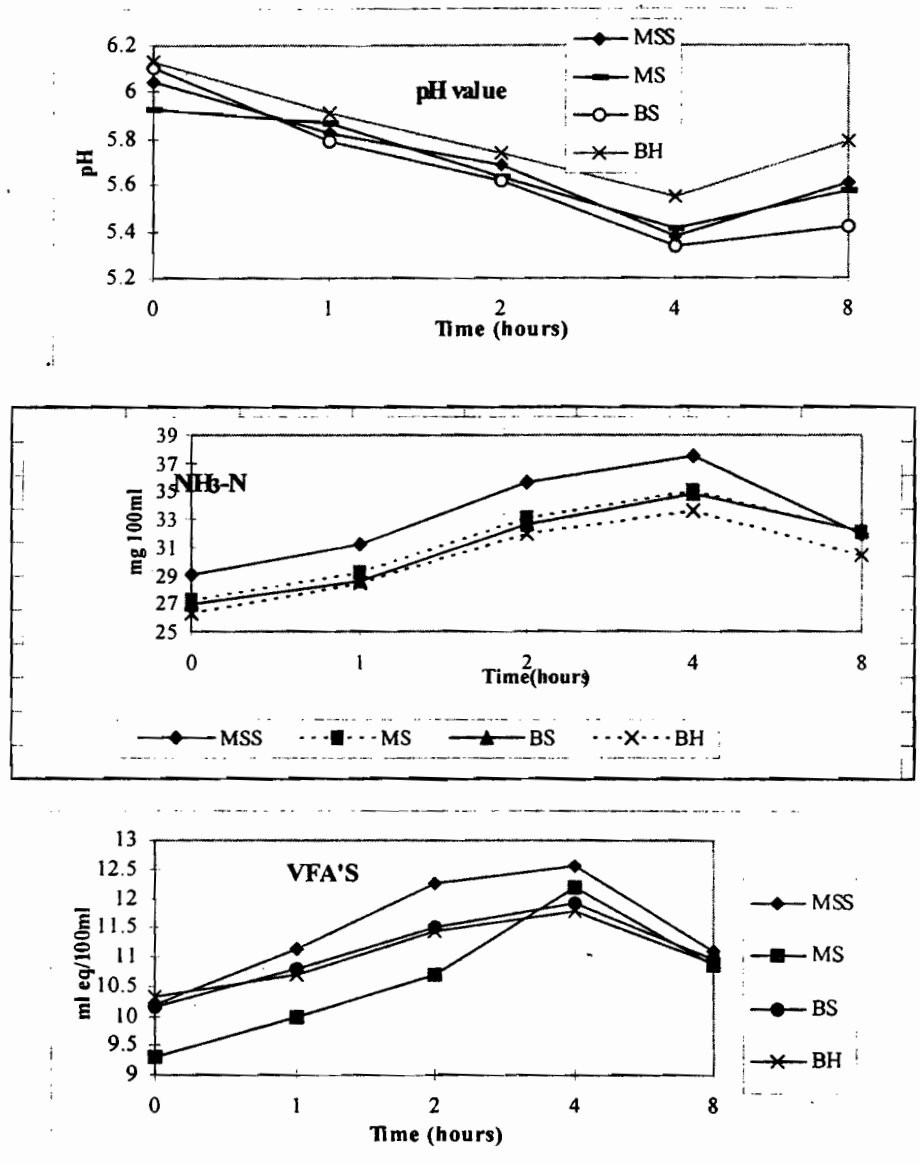

Figure 1: Changes in rumen parameters of buffalo male calves fed different types of silages and berseem hay.

Protozoa Count:

Results showed that, total protozoa count was decreased after feeding till 6hr in all experimental groups (Figure 4), as revealed by (Panjarathinam and laxminarayana, 1973). The high rate was at 2 and 4hr after feeding for all experimental rations, the difference was highly significant ($P<0.05$). While BH ration had the lowest number of protozoa at the same previously time. This may be due to the decreasing in pH value and

increasing TVFA's and ammonia nitrogen, usually after feeding (Sahfie *et al.*,1982 and El-Shazly and Sallam , 2000).

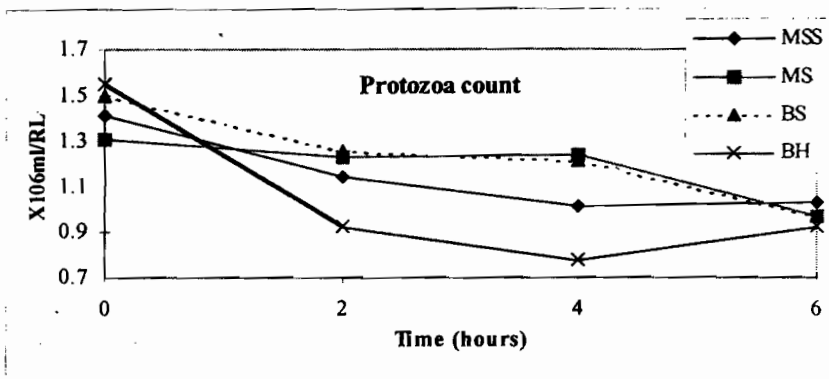

Figure 2: Changes of protozoa counts /ml in rumen liquor of buffalo male calves fed tested rations.

Table (4):The volatile fatty acids fractionations and acetic acid / propionic ratio for rumen liquor of buffalo calves .

group	Acids%	Time of feeding (hours)				
		Before feeding	Post feeding 1 hr	2 hr	4 hr	8 hr
	Acetic	48.20 ±0.18 ^{b}	45.35±0.41 ^{ab}	43.80± 0.28^{a}	45.40± 0.26^{a}	47.60 ± 0.25^{b}
	Propionic	39.30 ± 0.25^{c}	40.50 ±0.15 ^{c}	41.90 ± 0.06^{c}	40.90 ± 0.15^{d}	39.30 ± 0.16^{c}
MSS	Butric	12.50± 0.37^{a}	14.15 ± 0.26^{a}	14.30 ± 0.31^{a}	13.70 ± 0.21 ^{b}	13.10 ± 0.26^{a}
	A/P ratio	1.226 ± 0.01^{a}	1.119 ± 0.01^{a}	1.045 ± 0.01^{a}	1.110 ± 0.01^{a}	1.210 ± 0.01^{a}
	Acetic	49.00 ± 0.15^{a}	46.10 ± 0.15^{a}	43.20 ± 0.10^{a}	45.70 ± 0.12^{a}	48.40 ± 0.25^{a}
	Propionic	40.30 ± 0.16^{b}	42.00 ± 0.22^{b}	43.90 ± 0.21^{b}	42.60 ± 0.15^{b}	40.20 ± 0.16^{b}
MS	Butric	10.70 ± 0.32^{b}	11.90 ± 0.07^{c}	12.90 ± 0.30^{b}	11.70 ± 0.10^{c}	10.90 ± 0.38^{b}
	A/P ratio	1.22 ± 0.001^{a}	1.10 ± 0.009^{a}	0.98 ± 0.003^{b}	1.07 ± 0.006^{b}	1.22 ± 0.004^{a}
	Acetic	48.00 ± 0.15 ^{b}	44.00 ± 0.05^{c}	41.60 ± 0.31^{b}	44.60 ± 0.21^{b}	47.70 ± 0.17^{b}
	Propionic	41.00 ± 0.15^{a}	43.40 ± 0.11^{a}	45.40 ± 0.15^{a}	43.40 ± 0.15^{a}	41.80 ± 0.15^{a}
BS	Butric	11.00 ± 0.02^{b}	12.90 ± 0.07^{b}	13.00 ± 0.45^{b}	12.00 ± 0.10^{c}	10.50 ± 0.31^{b}
	A/P ratio	1.17 ± 0.008^{c}	1.02 ± 0.004^{b}	0.92 ± 0.004^{c}	1.03 ± 0.008^{c}	1.14 ± 0.003^{b}
	Acetic	47.70 ± 0.20^{b}	45.00 ± 0.15^{b}	43.20 ± 0.12^{a}	44.20 ± 0.20^{b}	46.30 ± 0.20^{c}
	Propionic	39.90 ± 0.10^{b}	40.90 ± 0.12^{c}	42.00 ± 0.10^{c}	41.50 ± 0.09^{c}	39.90 ± 0.09^{d}
BH	Butric	12.40 ± 0.30^{a}	14.10 ± 0.05^{a}	14.63 ± 0.22^{a}	14.30 ± 0.21^{a}	13.73 ± 0.13^{a}
	A/P ratio	1.195 ± 1.20^{b}	1.100 ± 1.10^{a}	1.028 ± 1.03^{a}	1.065 ± 1.06^{b}	1.158 ± 1.16^{b}

a,b, c,d Means with different superscripts in each column differ significantly (p< 0.05).

REFFERENCES

A.O.A.C. (1980) Association of Official Analytical Chemists. Official Methods of Analysis, 13 th ed Washington, D.C.U.S.A

Abou-Akkada, A.R. and K. El-Shazly (1964). Effect of absence of ciliare protozoa from thr rumen on microbial activity and growth of lambs. Appl . Microbiol., 12 : 348.

Ali, C.S.and A.N. Sorenson (1979). Effect of level of urea-N on its utilization in alkali treated wheat straw in pelleted ration by sheep. Acta. Agric. Scand. 29 : 17.

Bendary, M.M.; S.A .Mahmoud ; E.M. Abd El-Roof; M.K. Mohsen and H.M.A.Gaafar(2001a). Economical and nutritional evaluation of ensiling corn crop. Proc 8 th Animal Nutration, 23-26 October 2001 Sharm El-Sheikh, Egypt. Egyptian. J. Nutr and Fedds (2001) (Special Issue) 89-103.

Bendary, M.M. ; G.H.A. Ghanem; E.S. Soliman; E.A .Amer and F.A. El-Zeer (2001b). Nutrition evaluation of ensiling fresh maize stover. Proc 8th Animal Nutration, 23-26 October 2001 Sharm El-Sheikh, Egypt. Egyptian. J. Nutr and Fedds (2001) (Special Issue) 105-116

Black, J.L. ; M. Gill; D.E. Beever; J.H.M. Thorely and J.D .Oldman. (1987) Sitmulation of the metabolism of absorbed energy yielding nutrients in young sheep. Efficiency of utilization of acetate. J. Nutr., 117:105.

Carro, M.D.; A.R.I.A.Wright and I.J.Gordon (1994). Effect of time of upplementary feeding on intake apparent digestibility and rumen fermentation of grass hay by sheep. Anim. Prod. 59:217-222.

Con-Way, E.J. (1957). Microdiffiusion Analysis and Volumetric. Error. 5th. Ed, Crosky-Lockwood and Sons Ltd., London.

Delcurto, T. ; R.C. Cohran; T.G. Nagaraja; L.R. Corah; A.A. Beharka and E.S. Vazant (1990). Comparision of soyabean meal/sorghum grain, alfalfa hay and dehydrated alfalfa pellets as supplemental protein sources for beef cattle consuming dormant tallgrass-prairie forage. J. Anim Sci 1990. 68 : 2901-2915.

Deraz, T.A.A. (1996) The production of microbial protein from some agricultural wastes and its utilization in ruminant. Ph. D. Thesis Environmental Studies and Research, Ain Shams Univ.

El-Saifi, A.A. (1969). The diagnostic value of ruminal juice examination in cases of indigestion in buffaloes. M.D.V. Thesis. Faculty of Vet. Mea. Cairo University.

El-Ayouty, A.M. (1976). Studies on rumen microbial activity. M.Sc. Thesis, Fac. Of Agric. Univ. Of Alexandria.

El-Shazly, K.A and S.M.A. Sallam. (2000). Microbial protein synthesis in the rumen and factors affecting it. Proc. Conf. Anim. Prod in The 21th Century, Sakha, 18-20 April 2000:33-48.

Ensminger, M.E.;J.E.Oldfield and W.W. heinemann (1990). Feeds and Feeding 2nd Ed.Text Book.343. Clovis, California U.S.A.

Etman, K.E.I. ; E.A. Khafagi ; W.H. Abd El-Mailk; M.K Hathout and M.F. El-Sayes (1994). Conservation of green summer forages as silage and its utilization in feeding growing lambs. Egyp. J.Anim. produ. 31 supple: 175.

Khalifa, H.A.A. (1972). Effect of 1ow level of coares roughage supplement on the rumen fermentation of sheep. Sudan J. Vet. Sci. Anim. Husb., 13 :11.

Khinizy, A.E.M.; R.T. Fouad ; M.M. Mohy El-Deen; B.B.Matter and A.A.M.Fahmy (1997). Effect of feeding whole green maize silage with urea molasses mineral mixture on performance of buffalo calves. Egypt. J. Appl. Sci., 12 :408

Mahmoud, A.M.; M.M.Bendary; M.A. Harfoush and G.A. Ramadan.(1992). Effect of Feeding lacting cows corn silage on milk production compared with traditional summer and winter ration. J. Agric. Sci, Mansoura univ. 17:2904-2915.

Mahmoud,S.A.; G. El-Santiel and M.F.Ali (1998). Dried sugar beet pulp as a grain replasement for sheep rations. J. Agric. Res. Tanta Univ. 24:118.

McDonald, P.; R.A. Edwards; J.F.D. Greenhalgh and C.A. Morgan (1995). Animal Nutrition. 5th Ed. Copy rights Licensing LTD.London.

Mostafa, M.R.M.; M.F. El-Sayes; K.E.I.Etman and M.K.Hathout. (2000). Evaluation of maize stover silage in comparison with whole maize silage in sheep rations. Conference Animal, Fish and Poultry Production El-Arish 7-5 2000(SI).

Montgomery, M.J.; H.A. Frbourg; I.R.Overtnb and W.M. Hopper (1973).Effect of maturity of corn on silage quality and milk production. J. Dairy Sci., 57:698.

Nadra, K.S. ; I.S.Thind and A.K.Chopra. (1985). Nutritive value of mixed silage of berseem and oat fodder. Journal-of -Research,-Punjab-Agricultural-University. 1985, 22:1, 192-194.

Perry,T. W. and M.J. Cecava (1995). Beef cattle feeding and nutrition 2nd Ed., Academic press, INC,USA.

Panjarathinam, R and H. Laximinarayana.(1973). Indian J. Of. Anim Sci., 44:338.

Sahfie, M.M. ; H.M.Mourad; M.A. Salama and I.A.Khalil (1982). Development of alimentary tract and alimentation in buffaloes, IV. Characteristics of rumen liquor in buffalo calves. A proceedings of the sixth international conference on animal and poultry production. Zaga-Zig, Sep. 21-23, pp 370-379.

SAS. (1988). SAS User,s Guide : Statistics, Inst. Cary, D. C.

Shehata, O. (1970). Lectures in Animal Production. Fac Agric., Ain Shams Univ. (In Arabic).

Van Keulen, J. and B.A.Young. (1977). Evaluation of acid-insoluble ash as a natural marker in ruminant digestibility studies. J. Anim . Sci., 44: 2982.

الأداء الأنتاجى لعجول الجاموس بأستخدام الأعلاف الخضراء المحفوظة:
١- تقيم أنواع مختلفة من العلف الأخضر المحفوظ فى صورة سيلاج أو دريس برسيم.

محمد السعيد لاشين[١] _ سهير محمود زيدان[٢] _ هشام سعيد على[٢] .
١-قسم الأنتاج الحيواني _كلية الزراعة جامعة الأزهر.
٢_معهد بحوث الأنتاج الحيواني، الدقي، القاهرة.

استخدم ١٢عجل جاموس متوسط أوزانهم ٣٥٩,٢٥ كيلو جرام في أربعة تجارب هضم (٣في كل مجموعه) لتقدير معاملات الهضم و القيمة الغذائية للعلائق المحتوية على ٧٠% علف مركز ، ١و٨ % قش أرز مع ٢١,٩%سيلاج او دريس وكانت مجموعات تجربة الهضم كمايلى مجموعة سيلاج حطب الذرة الخضراء (MSS) ، سيلاج نبات الذرة الكامل بالكيزان (MS) ، سيلاج البرسيم المصري حشة أولي (BS) وكذلك دريس البرسيم (BH) . وقد أظهرت النتائج أن كل أنواع السيلاج جيدة وكانت قيم السيلاج من حيث pH تتراوح من (٣,٩ إلي ٤,٤) ونيتروجين الأمونيا يتراوح من (٠,١٩ إلي ١,٢٧ مللي جرام لكل جرام مادة جافة) ومجموعة الأحماض الدهنية الطيارة من ١,٥ إلي ١,٩٣ مللي مول لكل ١٠٠ مللي مستخلص سيلاج.

وكان استهلاك المادة الجافة من عليقه السيلاج المختبره والدريس تتراوح ما بين (١١,٠٧٧ كيلو جرام إلي ١٢,١٠١ كيلو جرام للراس فى اليوم) بدون فروق معنوية . وكانت معاملات هضم المادة الجافة ، المادة العضوية ، الألياف الخام ، الرماد مرتفعة معنويا عند مستوي معنوي ٥% في عليقه سيلاج الذرة بالكيزان وسيلاج البرسيم حشة أولي عن علائق سيلاج حطب الذرة ودريس البرسيم . بينما كان معامل هضم البروتين لسيلاج البرسيم يزيد معنويا عند مستوى ٥% عن عليقه دريس البرسيم ومن ناحية أخري كان معامل هضم عليقه دريس البرسيم متشابها نوعا (ماعدا معامل هضم مستخلص الاثيرى) مع عليقه سيلاج حطب الأنره وكانت القيمة الغذائية في صورة معادل نشا أو مجموع المركبات الغذائية المهضومة عالية مع كل من سيلاج البرسيم وعليقه سيلاج الأنره بالكيزان عن العلائق الأخرى وكانت الاختلافات معنوية عند مستوى ٥% بينما البروتين المهضوم للعليقه المحتوية على سيلاج حطب الأنرة وسيلاج نبات الأنرة بالكيزان كان منخفضا معنويا عند مستوي ٥% عن عليقه سيلاج البرسيم أو عليقه دريس البرسيم .

وكان تركيز أمونيا الكرش والأحماض الدهنية الطيارة الكلية وقيمة pH عالية في جميع الأوقات (١، ٢ ، ٤ ، ٨ ساعة) بالنسبة لعليقه سيلاج حطب الأنرة مقارنة بالعلائق الاخرى المختبرة.