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PRODUCTIVE PERFORMANCE OF LACTATING BUFFALOES FED RATIONS CONTAINING SUGAR BEET TOPS AND CORN SILAGES

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ABSTRACT

Sixteen multiparous lactating buffaloes in 2nd and 5th lactating season and weighing 500 to 600 kg were used after 8 weeks of calving in complete switch–back design with four groups. Buffaloes in the first group were fed the control ration (R1) containing 60 % concentrate feed mixture (CFM) + 20 % rice straw (RS) + 20 % berseem hay (BH) on DM basis, while in the other groups buffaloes were fed rations consisted on DM basis of 40 % CFM + 20 % RS + 40 % sugar beet tops silage (SBTS) and corn silage (CS) in different ratios, 2:1 (R2), 1:1 (R3) and 1:2 (R4) on DM basis, respectively. Results showed that the contents of CP and ash increased with increasing the proportion of SBTS, but OM, CF and NFE contents increased with increasing the proportion of CS in the rations. Digestibility coefficients of DM, OM, CF, EE and NFE, TDN and feed intake as DM and TDN increased ($P<0.05$) with increasing CS level, however, CP digestibility, DCP value and CP and DCP intake increased ($P<0.05$) with increasing SBTS level. The pH value and NH_3-N concentration increased ($P<0.05$) with increasing SBTS level of, however TVFA's concentration in rumen liquor (RL) increased ($P<0.05$) with increasing CS level. Buffaloes fed R3 recorded ($P<0.05$) the highest milk and 7% FCM yield, however, those fed R1 had the lowest yield. The percentages of fat, lactose and total solids (TS) in milk increased ($P<0.05$) with increasing CS level, however, the percentages of protein, solids not fat (SNF) and ash increased ($P<0.05$) with increasing SBTS level. Animals fed R3 showed the lowest amounts of DM and TDN required per kg 7% FCM while R4 showed the lowest amounts of CP and DCP required per kg 7% FCM. however, those fed R1 revealed the highest amounts ($P<0.05$). Buffaloes fed R3 showed the lowest feed cost/kg 7% FCM and the highest price of 7% FCM and economic efficiency, but those fed R1 had on opposite trend ($P<0.05$).

Keywords: Digestibility, rumen activity, milk yield ,milk composition, economic efficiency.

INTRODUCTION

In Egypt, the total planted area of sugar beet was about 167 thousand feddans (feddan = 0.42 hectare) (Agriculture Economics, 2006). 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 grazing livestock in harvested fields should be aware of the risk of livestock choking on small beets (Cattanach *et al*., 1991). It was demonstrated that beet tops (leaves and petioles) also can be used as silage. Sugar beets that produce about 15 tons / feddan of roots and 4 tons / feddan of TDN in the tops. Tops are an excellent source of protein, vitamin A, and carbohydrates. Beet top silage is

best fed in combination with other feeds. So, ensiling the sugar beet tops may contribute in solving some problems concerning resources shortage of animal feeding in Egypt, especially in summer season and minimize the pollution. It may offer a reduction of feed cost and minimize quantities of the expensive concentrate feedstuffs used in animal feeding (Mohiel-Din *et al*., 2000 and Bendary *et al*., 2000). The TDN values of sugar beet tops silage ranged from 45.66 % (Bendary *et al*., 1992) to 61.65 % (Eweedah *et al*., 1999) and DCP value from 6.00 % (Kripal *et al*., 1975) to 12.05 % (Eweedah *et al*., 1999). In Egypt, the total planted area of corn crop was about one million feddans and about 25% of this area was used as silage (Agriculture Economics, 2006). Average yield of fresh corn crop was 18.55 ton on wet basis, 5.43 ton DM, 3.45 ton TDN and 367.16 kg DCP per feddan (Gaafar, 2009). Moreover, it may offer a significant reduction of feed cost as well as reduction of using concentrate feed mixture for lactating cows (Mahmoud *et al*., 1992) or replacing fresh berseem in ration of lactating cows (Ahmed *et al*., 2003). The objective of this study was to investigate the effect of feeding sugar beet tops and corn silages at different ratios on nutrients digestibility, rumen activity, milk production, feed conversion and economic efficiency of lactating buffaloes.

MATERIALS AND METHODS

Making silage

Sugar beet tops were collected from sugar beet fields at the harvesting time and wilted for 48 hours to diminish the moisture content to about 65-70% before ensiling. Whole corn plants *single cross 10* was harvested at dough stage of maturity, chopped into 1-1.5 cm of length. Wilted sugar beet tops and chopped corn were ensiled between feed toughs, where 30 cm layer of rice straw spread on the ground as bed to absorb seepage and to prevent contamination with earth. 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 (sodium carbonate) was added at 2 kg per tone of sugar beet tops to compensatory calcium binding with oxalate. The material was compressed by heavy drum filled with sand, then covered with plastic sheet, hard pressed with 30 cm of soil layer and ensiled for eight weeks.

Experimental animals and design

Sixteen multiparous lactating buffaloes in 2nd and 5th lactating season and weighing 500 to 600 kg were used after 8 weeks of calving in complete switch–back design (4 x 4) of four groups and three successive experimented periods. Each periods consisted of 28 days, the first 14 days of each period were considered as a transition period followed by 14 days as test period, as described by Lucas (1956).

Experimental rations and management

Buffaloes in the first group were fed the control ration (R1) containing 60 % concentrate feed mixture (CFM) + 20 % rice straw (RS) + 20 % berseem hay (BH) on DM basis, while in the other groups buffaloes were fed rations containing 40 % CFM + 20 % RS + 40 % sugar beet tops silage

(SBTS) and corn silage (CS) in different ratios, 2:1 (R2), 1:1 (R3) and 1:2 (R4) on DM basis, respectively. Concentrate feed mixture contained 35% undecorticated cotton seed cake, 20% wheat bran, 24% yellow corn, 10% rice bran, 5% line seed cake, 3% molasses, 2% limestone and 1% common salt. Lactating buffaloes were individually fed to cover the recommended requirements according to Animal Production Research Institute (1997) for lactating buffaloes. Rations were recalculated every two weeks based on milk yield and body weight of animals. Concentrate feed mixture was offered two times daily at 8 a.m. and 4 p.m., berseem hay once daily at 11 a.m. rice straw was given two times at 9 a.m. and 5 p.m., while sugar beet tops and corn silages once daily at 10 a.m. Buffaloes were allowed to drink water three times a day at 7 a.m., 1 and 7 p.m. and were kept under the routine veterinary supervision through the whole feeding trial.

Digestibility trials

Four digestibility trials were conducted during the 2nd period of feeding trial with 4 animals from each group to determine nutrients digestibility coefficients and nutritive values of the experimental rations using acid insoluble ash (AIA) as a natural marker (Van Keulen and Young, 1977). Feces samples were taken from the rectum of each animal twice daily with 12 hours interval during the collection period. Samples of tested feedstuffs were taken at the beginning, middle and end of collection period. The samples of feedstuffs and feces were collected and representative samples were analyzed according to AOAC (1995).

Rumen liquor samples

Rumen liquor samples were collected at 3 hours after the morning feeding from buffaloes during the 2nd period of feeding trial using a stomach tube and filtered through double layers of cheese cloth. Value of pH in (RL) was determined directly using Orian 680 digital pH meter. The concentration of total VFA's was determined in rumen liquor samples by the steam distillation method (Warner, 1964) using markham micro-distillation apparatus. The concentration of NH_3-N in RL was determined using saturated solution of magnesium oxide distillation according to the method of AOAC (1995).

Milk yield

Individual morning and evening milk yield of lactating buffaloes were recorded daily and corrected for 7% fat content (FCM) using the formula of 7% FCM = 0.265 x milk yield (kg) + 10.5 x fat yield (kg) as stated by Raafat and Saleh (1962). Milk samples from consecutive evening and morning milking were taken at the 4th week of each period and mixed in proportion to yield. Milk contents of fat, protein, lactose and total solids were determined using Milko-Scan 133B Foss Electric (Foss Electric, Denmark).

Feed conversion and economic efficiency:

Feed conversion was calculated as the amounts of DM, TDN (kg) and DCP (gm) required to produce 1 kg 7% FCM.

Economic efficiency was expressed as the daily feed cost, price of daily 7% FCM, feed cost per kg 7% FCM and the ratio of price of daily 7% FCM and daily feed cost. The price of one ton was 1600 LE for concentrate feed mixture, 700 LE for berseem hay, 75 LE for rice straw, 80 LE for sugar beet

tops silage and 150 LE for corn silage. While, the price of one kg 7% FCM was 3 LE according to prices of year 2009.

Statistical analysis

The data were subjected to statistical analysis according to Lucas (1956). Statistical model was as follows:

$$Y_{ijk} = U + T_i + E_{ik}$$

where:

Y_{ijk} = the observation ik

U = Overall mean

T_i = Treatments

E_{ik} = Experimental error associated with i and k observations assumed to be randomly distributed.

The Duncan multiple range test was used to compare difference between means (Duncan, 1955).

RESULTS AND DISCUSSION

Chemical composition of feedstuffs and experimental rations

Chemical composition of tested feedstuffs and experimental rations shown in Table (1) revealed that the contents of CP and ash were high(14.78 and 19.62 vs8.15 and 6.7) and OM, CF and NFE contents were lower in sugar beet tops silage compared with corn silage (80.38, 12.80 and 50.25 vs. 93.30, 23.85 and 58.32 %), respectively. So, the contents of CP and ash in experimental rations increased with increasing proportion of sugar beet tops silage, but the contents of OM, CF and NFE increased with increasing the proportion of corn silage. These results are in convenient with those obtained by Bendary *et al*. (2000) for sugar beet tops silage and Ahmed *et al*. (2003) for corn silage.

Table 1: Chemical composition of feedstuffs and experimental rations used in feeding buffaloes.

Item	DM %	Composition of DM %					
		OM	CP	CF	EE	NFE	Ash
Feedstuffs							
Concentrate feed mixture	91.20	91.60	16.25	12.45	3.20	59.70	8.40
Berseem Hay	90.50	87.40	13.30	25.40	2.60	46.10	12.60
Sugar beet tops silage	25.60	80.38	14.78	12.80	2.55	50.25	19.62
Corn silage	28.35	93.30	8.15	23.85	2.98	58.32	6.70
Rice straw	90.85	83.25	2.55	32.50	1.55	46.65	16.75
Calculated composition of experimental rations:							
R1 (control)	91.99	89.09	12.92	19.05	2.75	54.37	10.91
R2	45.80	86.73	12.26	17.71	2.27	54.50	13.27
R3	46.61	88.03	11.60	18.81	2.44	55.18	11.97
R4	47.45	89.32	10.93	19.92	2.61	55.86	10.68

R1: 60% CFM + 20% RS + 20% BH (Control).
R2: 40% CFM + 20% RS + 40% SBTS & CS (2:1).
R3: 40% CFM + 20% RS + 40% SBTS & CS (1:1).
R4: 40% CFM + 20% RS + 40% SBTS & CS (1:2).

Digestibility coefficients and nutritive values

Digestibility coefficients and nutritive values of experimental rations intake by lactating buffaloes are presented in Table (2). The digestibility coefficients of DM, OM, CF, EE and NFE and TDN value increased (P<0.05) with increasing the level of corn silage R4 However, CP digestibility and DCP value increased (P<0.05) with increasing the level of sugar beet tops silage in R2. while, control ration recorded the highest CP digestibility and DCP value. Variations in nutrients digestibility may be attributed to the differences in chemical composition of tested feedstuffs and experimental rations. These results are in agreement with those obtained by Mahmoud *et al*. (1992) and Ahmed *et al*. (2003) that found the digestibility of DM, OM and NFE and TDN value increased with elevating the level of corn silage in the rations. Bendary *et al*. (2000) reported that the digestibility of CP and DCP value were higher with sugar beet tops silage.

Table 2: Digestibility coefficients and nutritive values of the experimental rations intaked by buffaloes fed different experimental rations.

Item	Experimental ration				SEM
	R1	R2	R3	R4	
Digestibility coefficients %:					
DM	67.22^{b}	67.78^{ab}	68.48^{ab}	69.58^{a}	0.39
OM	68.23^{b}	68.82^{ab}	69.53^{ab}	70.74^{a}	0.41
CP	63.81^{b}	67.79^{a}	66.11^{b}	64.74^{b}	0.53
CF	60.91^{c}	61.98^{bc}	63.03^{ab}	64.37^{a}	0.60
EE	73.95^{b}	74.85^{ab}	75.24^{ab}	76.06^{a}	0.37
NFE	71.20^{b}	73.35^{a}	75.03^{a}	76.89^{a}	0.76
Nutritive values %:					
TDN	63.13^{c}	63.08^{c}	65.05^{b}	67.32^{a}	0.53
DCP	8.24^{a}	8.31^{a}	7.67^{b}	7.08^{c}	0.15

a, b, c: Means in the same row with different superscripts differ at 5%.
R1: 60% CFM + 20% RS + 20% BH (Control).
R2: 40% CFM + 20% RS + 40% SBTS & CS (2:1).
R3: 40% CFM + 20% RS + 40% SBTS & CS (1:1).
R4: 40% CFM + 20% RS + 40% SBTS & CS (1:2).

Average daily feed intake

Feed intake of lactating buffaloes fed different tested rations are shown in Table (3). Buffaloes fed the control ration showed (P<0.05) the highest intake of DM, CP and DCP, while those fed R4 had (P<0.05) the highest TDN intake. feed intake as DM and TDN increased (P<0.05) with increasing the level of corn silage, however, feed intake as CP and DCP increased (P<0.05) with increasing level of sugar beet tops silage in the rations. The variations in feed intake may be attributed to the differences in the palatability of different feedstuffs by animals. The lower DM intake with sugar beet tops silage may be attributed to its laxative effect. These results are in agreement with those obtained by Mahmoud *et al*. (1992) and Ahmed *et al*. (2003), who found that DM and TDN intake by cows increased with increasing the level of corn silage in the ration. Bendary *et al*. (2000) indicated that feeding dairy cows on ration containing sugar beet tops silage reduced the intake of DM and TDN.

Rumen activity:

Rumen liquor parameters in Table (3) revealed that pH value and NH_3-N concentration decreased (P<0.05), however TVFA's concentration increased (P<0.05) with increasing the level of corn silage and decreasing the level of sugar beet tops silage in the rations. This finding may be due to the degradation of protein to ammonia and carbohydrates fermented to TVFA's in the rumen. Ruminal microorganisms utilize more NH_3-N when more energy sources are fermented (Hungate, 1966). Russell and Dombrowski (1980) reported that ruminal total VFA production was closely related to ruminal pH, which can be considered an important regulator of microbial yield. Baker (1990) found that feeding silage high in NH_3-N concentration was associated with high ruminal NH_3-N concentration. Also, he reported that ruminal total VFA concentration decreased with feeding sugar beet tops silage. 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 degree.

Table 3: Average daily feed intake and rumen activity of buffaloes fed different experimental rations.

Item	Experimental ration				SEM
	R1	R2	R3	R4	
Feed intake (kg/head/day)					
Concentrate feed mixture*	10.87	6.93	7.03	7.14	
Berseem hay*	3.65	-	-	-	
Rice straw*	3.64	3.48	3.53	3.59	
Sugar beet tops silage*	-	18.83	12.52	6.36	
Corn silage*	-	5.58	11.31	17.24	
DM	16.52^{a}	15.81^{c}	16.03^{bc}	16.29^{ab}	0.09
TDN	10.43^{b}	9.97^{c}	10.43^{b}	10.97^{a}	0.12
CP	2.13^{a}	1.94^{b}	1.86^{c}	1.78^{d}	0.04
DCP	1.36^{a}	1.31^{b}	1.23^{c}	1.15^{d}	0.03
Rumen activity					
pH value	6.72^{a}	6.65^{ab}	6.52^{bc}	6.41^{c}	0.02
TVFA's (meq/ 100 ml)	14.95^{d}	16.35^{c}	17.20^{b}	18.85^{a}	0.40
NH_3-N (mg/ 100 ml)	23.65^{b}	25.30^{a}	21.84^{c}	19.75^{d}	0.53

a, b, c and d: Means in the same row with different superscripts differ at 5%.
R1: 60% CFM + 20% RS + 20% BH (Control).
R2: 40% CFM + 20% RS + 40% SBTS & CS (2:1).
R3: 40% CFM + 20% RS + 40% SBTS & CS (1:1).
R4: 40% CFM + 20% RS + 40% SBTS & CS (1:2).
*** As fed.**

Average daily milk yield

Results in Table (4) revealed that actual yield (AMY) milk and 7% FCM yield of buffaloes fed tested rations (R2-4) were higher (P<0.05) THAN THAT OF those fed R1 (control ration). Buffaloes fed R3 contained sugar beet tops and corn silages (1:1) recorded (P<0.05) the highest AMY and 7% FCM yield, however those fed R1 (control ration) had the lowest yields (11.25 and 9.96 vs. 9.16 and 7.85 kg/day, respectively). The higher milk yield

recorded by buffaloes fed R3 may due to suitable TDN and DCP contents (Table 2) as well as ruminal TVFA's concentration (Table 3). These results indicated that using sugar beet tops and corn silages in feeding lactating buffaloes is surprise in replacing berseem hay and rice straw as a source of roughage to save a part of high expensive concentrate feed mixture (20 %) as well as increasing milk production. These results agreed with those obtained by Mahmoud *et al.* (1992) and Ahmed *et al*. (2003), who recorded that milk yield of Friesian cows increased with increasing the level of corn silage in the ration. Bendary *et al*. (1996, 2000) reported significant increase in milk and 4% FCM yield of Friesian cows fed rations containing sugar beet tops silage.

Milk composition

Milk composition of buffaloes as affected by feeding rations containing sugar beet tops and corn silages is shown in Table (4). There were significant differences (P<0.05) in milk composition among the different groups. The percentages of fat, lactose and total solids (TS) increased (P<0.05), however the percentages of protein, solid not fat (SNF) and ash decreased (P<0.05) with increasing the level of corn silage and decreasing the level of sugar beet tops silage in the rations. Increasing fat percentage with increasing the level of corn silage may be due to the higher fermentation of fibers into volatile fatty acids in rumen (Table 3) which subsequently converted to fat in milk. Also, protein and lactose contents increased in similar trends to that of DCP and TDN intake (Table 3). These results agreed with those obtained by Bendary *et al*. (2000) and Ahmed *et al*. (2003).

Table (4): Milk yield and composition of buffaloes fed different experimental rations.

Item	Experimental ration				SEM
	R1	R2	R3	R4	
Milk yield (kg/day)	9.16^{b}	9.78^{ab}	11.25^{a}	10.63^{a}	0.39
7% FCM (kg/day)	7.85^{b}	8.66^{ab}	10.10^{a}	9.73^{a}	0.39
Milk composition %					
Fat	5.64^{b}	5.90^{ab}	6.02^{ab}	6.18^{a}	0.08
Protein	3.54^{ab}	3.69^{a}	3.52^{ab}	3.34^{b}	0.05
Lactose	5.42^{b}	5.56^{ab}	5.65^{ab}	5.78^{a}	0.05
SNF	9.66^{b}	9.98^{a}	9.89^{ab}	9.83^{ab}	0.08
TS	15.30^{ab}	15.88^{b}	15.91^{ab}	16.01^{a}	0.13
Ash	0.70^{c}	0.73^{a}	0.72^{ab}	0.71^{bc}	0.004

a, b and c: Means in the same row with different superscripts differ at 5%.
R1: 60% CFM + 20% RS + 20% BH (Control).
R2: 40% CFM + 20% RS + 40% SBTS & CS (2:1).
R3: 40% CFM + 20% RS + 40% SBTS & CS (1:1).
R4: 40% CFM + 20% RS + 40% SBTS & CS (1:2).

Feed conversion:

There were significant differences (P<0.05) in feed conversion among buffaloes fed different experimental rations as shown in Table (5). Feed conversion improved by feeding rations containing sugar beet tops and corn silages. Animals fed R3 showed (P<0.05) the lowest DM and TDN/ kg 7%

FCM, while R4 showed the lowest CP and DCP/kg 7% FCM. However, those fed the control ration (R1) showed the highest DM, TDN, CP and DCP/ kg 7% FCM. These results are in accordance with those obtained by Bendary *et al*. (2000) and Ahmed *et al*. (2003), who found better feed efficiency attained by feeding Friesian cows in ration containing sugar beet tops or corn silages.

Economic efficiency:

Economic milk efficiency illustrated in Table (5) revealed significant differences (P<0.05) among different treatment groups. Buffaloes fed the control ration (R1) showed the highest average daily feed cost and feed cost / kg of milk as 7% FCM and the lowest price of milk yield as 7% FCM reflecting the lowest economic efficiency (P<0.05). However, buffaloes fed R3 contained sugar beet tops and corn silages (1:1) showed the lowest feed cost / kg of 7% FCM and the highest price of 7% FCM yield and economic efficiency (P<0.05). These results may be due saving higher amount of high expensive concentrate feed mixture and also replacing high expensive berseem hay, as well as, increasing milk yield with feeding rations containing sugar beet tops and corn silages. These results are in accordance with those obtained by Bendary *et al*. (1996, 2000), who found that cows fed sugar beet tops silage along with concentrate was the most economic milk producers compared with cows fed traditional summer ration. Feeding lactating cows on ration containing corn silage reduced daily feed cost and improved economic efficiency (Mahmoud *et al*., 1992 and Ahmed *et al*., 2003). El-Nahas *et al*. (2009) found that feeding growing calves on rations containing sugar beet tops silage improved economic efficiency.

Table 5. Feed conversion and economic efficiency of buffaloes fed different experimental rations.

Item	Experimental ration				±SEM
	R1	R2	R3	R4	
Feed conversion					
DM (kg) / kg 7% FCM	2.11^{a}	1.83^{b}	1.59^{c}	1.67^{c}	0.06
TDN (kg) / kg 7% FCM	1.33^{a}	1.15^{b}	1.03^{c}	1.13^{b}	0.03
CP (g)/kg 7% FCM	272.16^{a}	223.88^{b}	184.18^{c}	183.11^{c}	11.08
DCP(g) / kg 7% FCM	173.63^{a}	151.76^{b}	121.74^{c}	118.53^{c}	6.87
Economic efficiency:					
Average daily feed cost (LE)	20.22^{a}	13.67^{d}	14.21^{c}	14.80^{b}	0.79
Feed cost (LE)/ kg 7% FCM	2.58^{a}	1.58^{b}	1.41^{c}	1.52^{b}	0.14
Price of kg 7% FCM (LE)	23.55^{c}	25.98^{b}	30.30^{a}	29.19^{a}	0.84
Economic efficiency	1.16^{c}	1.90^{b}	2.13^{a}	1.97^{b}	0.11

a, b, c and d: Means in the same row with different superscripts differ at 5%.
R1: 60% CFM + 20% RS + 20% BH (Control).
R2: 40% CFM + 20% RS + 40% SBTS & CS (2:1).
R3: 40% CFM + 20% RS + 40% SBTS & CS (1:1).
R4: 40% CFM + 20% RS + 40% SBTS & CS (1:2).

Conclusion

Sugar beet tops and corn silages as sources of roughage are more efficient especially to replace berseem hay and to save a part of concentrate feed mixture. Using sugar beet tops and corn silages (1:1) in ration of lactating buffaloes could improve milk production, feed conversion and economic milk efficiency.

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الأداء الإنتاجى للجاموس الحلاب المغذى على علائق تحتوى على سيلاج عروش بنجر السكر والذرة

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استخدم فى هذه الدراسة 16 جاموسة حلابة فى مواسم الحليب من الثانى إلى الخامس ووزنها 500 - 600 كجم بعد 8 أسابيع من الولادة فى تصميم switchback design قسمت إلى أربعة مجموعات0 غذيت المجموعة الأولى على عليقة المقارنة التى تتكون من 60% مخلوط علف مركز + 20% قش أرز + 20% دريس برسيم، بينما غذيت المجاميع الأخرى على علائق تتكون من 40% مخلوط علف مركز + 20% قش أرز + 40% سيلاج عروش بنجر السكر وسيلاج الذرة بنسبة 1:2 (المجموعة الثانية)، 1:1 (المجموعة الثالثة) و 2:1 (المجموعة الرابعة) على التوالى0

زيادة معاملات هضم كل من المادة الجافة والمادة العضوية والألياف والمستخلص الإثيرى والمستخلص الخالى من الأزوت ومحتوى المركبات الغذائية المهضومة والمأكول من المادة الجافة و المركبات الغذائية المهضومة معنويا على مستوى 0.05 مع زيادة مستوى سيلاج الذرة، بينما زاد معامل هضم الروتين ومحتوى البروتين المهضوم والمأكول من البروتين والبروتين المهضوم معنويا على مستوى 0.05 مع زيادة مستوى سيلاج عروش بنجر السكر فى العليقة0

زيادة قيمة درجة الحموضة وتركيز نيتروجين الأمونيا فى سائل الكرش معنويا مع زيادة مستوى سيلاج عروش بنجر السكر، بينما يزداد تركيز الأحماض الدهنية الطيارة الكلية معنويا مع زيادة مستوى سيلاج الذرة فى العليقة0 سجلت حيوانات المجموعة الثالثة أعلى إنتاجية للبن الفعلى واللبن المعدل 7% دهن، بينما كانت أقل إنتاجية فى المجموعة الأولى 0 زيادة النسبة المئوية للدهن واللاكتوز والجوامد الصلبة الكلية فى اللبن معنويا مع زيادة مستوى سيلاج الذرة، بينما تزداد النسبة المئوية للبروتين والجوامد الصلبة اللادهنية والرماد مع زيادة مستوى سيلاج عروش بنجر السكر فى العليقة0 أظهرت حيوانات المجموعة الثالثة أقل كمية من المادة الجافة والمركبات الغذائية المهضومة لكل 1 كجم لبن معدل 7% دهن وأعلى كفاءة اقتصادية والمجموعة الرابعة حققت أقل كمية من البروتين والبروتين المهضوم لكل 1 كجم لبن معدل 7% دهن0

نستخلص من هذه الدراسة أن استخدام كل من سيلاج عروش بنجر السكر وسيلاج الذرة كمصدر للمواد المالئة مفيد جدا لاستبدال دريس البرسيم وتقليل جزء من العلف المركز 0 استخدام سيلاج عروش بنجر السكر وسيلاج الذرة بنسبة 1:1 فى عليقة الجاموس الحلاب أدى إلى تحسن إنتاج اللبن والكفاءة الغذائية والاقتصادية0

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