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CULTIVATION AND EVALUATION OF SOME GREEN FORAGE MIXTURES AND ITS UTILIZATION IN FEEDING OF LACTATING ZARAIBI GOATS.

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SUMMARY

The objective of this work was to study cultivation and utilization of three intercropped green forage mixtures in feeding of lactating goats. Eighteen lactating goats divided into 3 groups (6 animals each) were fed *ad lib.* green forage mixtures as Sesbania-Sudan grass, Cow pea-Millet and Cowpea-Millet x Napier grass hybrid in three treatments, SS, CM and CMN respectively. 1% of BW Concentrate feed mixture (CFM) were allowed for all animals in the respective treatments. Three digestibility trials were carried out to evaluate the three rations by 3 bucks for each. Rumen and blood parameters were measured. Milk yield and its composition were determined. Forage yield and feed cost were estimated.

Results obtained showed that, CP% in Sesbania-Sudan grass mixture was higher than Cowpea-Millet or Cowpea-Millet x Napier grass hybrid mixtures, while, the CF, EE and NFE% of three mixtures were nearly similar. The DM intake of SS, CM and CMN as g/kg $W^{0.75}$ or % BW were nearly similar. The digestibility coefficients of DM, OM, CP and EE in SS with 1st and 2nd cuts were significantly ($P<0.05$) higher than CM, while the differences between SS and CMN or CM and CMN were not significant. The differences in NFE digestibility among the three groups were not significant. The TDN of SS showed significantly ($P<0.05$) higher than that of CM in the 1st and 2nd cuts, while the significant differences were found between CM and CMN in the 1st cut and not significant in the 2nd cut. The DCP of SS appeared the same previous trend. The differences in ruminal pH values among three groups were not significant. Ruminal ammonia-N of SS was significantly ($P<0.05$) higher than CM and insignificantly higher than CMN at 4hrs. Ruminal VFA,s of SS was significantly ($P<0.05$) lower and microbial protein was significantly ($P<0.05$) higher than CM and CMN at the same time (4 hrs post feeding). No significant differences among three groups for blood hemoglobin, red blood cells, serum total protein, albumin, globulin, creatinine and glucose. Milk yield were 1.15, 1.02 and 1.05 kg/h/day, showing no significant differences among its composition. Feed cost of milk were 98, 104 and 99 PT/kg milk for SS, CM and CMN, respectively. Forage yield were 4.43, 4.96 and 5.44 ton DM/feddan and 708, 717 796 kg CP/feddan for Sesbania-Sudan grass, Cowpea-Millet and Cowpea-Millet x Napier grass hybrid, respectively. It could be concluded that the mixture of Cowpea-Millet x Napier grass hybrid and Sesbania-Sudan grass appeared the higher yields and gave better digestibility and nutritive value and lower feed cost. So it could be use these mixtures beside 1% CFM in feeding of lactating goats.

Keywords: *sesbania, cowpea, sudan grass, millet, millet x napier grass hybrid, digestibility, rumen, blood, milk.*

INTRODUCTION

In Egypt, shortage of feed especially during summer season is affecting in animal production. Most of animal feeding in this period depend on grains and agricultural residues. The expensive price of grains tend to increase feed cost of animals. Green forage can play the important role to cover this shortage. It is cheap food for ruminant nutrition especially milk production, moreover improved animal health and reduced health expenses. The most green forages in summer season are grasses such as Sorghum, Sudan grass, Millet, Napier grass, and Teosinte which contains low protein content. So, its need protein source as concentrate or legume forages to be complete rations . High yielding and high quality legume-grass mixtures play an important part in forage-animal production system (Mooso and Wedin, 1990). An attempts were carried out to introduce new legumes as Sesbania (Soliman *et al*, 1997) or grasses as Millet x Napier grass hybrid (Zeidan and Geweifel, 1997) in animal feeding. On the other side, some practical studies were carried out to utilization some mixtures of legumes and grasses in ruminant feeding such cowpea with sorghum (Gabra *et al*, 1991) and Sesbania with Teosinte (Soliman *et al*., 1997 and Soliman and Haggag, 2002). The aim of this work is study cultivation and utilization of some intercropped legume-grass mixtures in feeding of lactating goats.

MATERIALS AND METHODS

This work was carried out at El-Serw Experimental Station (Damietta governorate), Agricultural Research Center (ARC), Egypt. Three field trials of legume-grass mixtures were conducted. The 1st trial was sowing Sesbania (Sesbania Sesban) intercropped with Sudan grass (Sorghum vulgare), the 2nd trial was Cowpea (Vigna sinesis) intercropped with Millet (Pennisetum maximum) and the 3rd trial was Cowpea intercropped with Millet (Pennisetum maximum) x Napier grass (Pennisetum purpureum) hybrid. The seed rate for the planted forage mixtures were 10, 10, 15 and 15 kg/feddan for Sesbania, Cowpea, Sudan grass and Millet, while Millet x Napier grass hybrid was planted by offshoots. The normal recommended agronomic practices of forages (fertilization and irrigation) were applied. Two cuts of green forage mixtures were taken. The 1st cut was done at 9 weeks from planting. The 2nd cut was taken after 7 weeks from 1st cut. The green yield and dry yield per feddan were estimated. Eighteen Zaraibi goats weighed an average 39 kg after weaning (12 weeks) were assigned randomly to three groups (6 animals each) according to their live body weight and initial milk production. The 1st group (SS) was fed 1% of body weight concentrate feed mixture (CFM) + Sesbania-Sudan grass mixture, the 2nd group (CM) was fed 1% of body weight CFM + Cowpea-Millet mixture and the 3rd group (CMN) was fed 1% of body weight CFM + Cowpea-Millet x Napier grass hybrid mixture. The CFM was offered twice daily at 8 a.m. and 3 p.m., while fresh green forage mixtures were fed ad libitum. Drinking water was available all times. The experimental period lasted 14 weeks of weaning.

Goats were milked and the daily milk yield was recorded for each goat. Representative milk samples about 0.5% of total milk produced were taken once biweekly from the morning and evening milking of the same day of each goat. The samples were composited and analyzed for total solids (TS), fat and protein by the methods of Ling (1963), lactose content according to Bamett and Abd El-Tawab (1957) and ash content as reported in A.O.A.C. (1995).

Digestibility trials were conducted on 9 mature bucks in complete randomized design to evaluate the three treatments (3 animals in each). Animals were individually kept in a metabolic cages. Each trial lasted 21 days as preliminary period followed by 7 days as collection period. Samples of green forage and feces were dried in an oven at 60oc for 48 hours, then thoroughly mixed and chemical analyzes were carried out according to the methods of A.O.A.C. (1995).

At the end of feeding trial, only three females of each group were used for collecting rumen fluid and blood samples. Rumen fluid samples were obtained using a rubber stomach tube at before morning feeding (0 time) and 4 hours post morning feeding. The samples were filtered through three layers of cheese cloth without squeezing. The ruminal fluid pH values were immediately estimated by a digetal pH-meter. The ruminal ammonia-N concentration was determined according to Conway (1957). Total volatile fatty acids (TVFA,s) were determined by the steam distillation method as described by Warner (1964). Microbial protein was determined according to Schultz and Schultz (1970).

Blood samples were taken via the jugular vein in evacuated tubes. Samples were kept at room temperature for 45 min, centrifuged at 4000 r.p.m. for 15 min. The blood serum was separated into clean dried glass vials and stored frozen at -20oc until analysis for total protein (TP) according to Armstrong and Carr (1964), Albumin (Daumas et al., 1971), glucose (Trinder, 1969). Urea-N (Patton and Crouch, 1977) and creatinine (Husdan, 1968).

Statistical analysis

The experiments were a complete randomized design. The statistical analysis were carried out with Costate version 3.03 Software (1986). Significance for mean differences were tested according to Duncan,s New Multiple Range Test (1955).

RESULTS AND DISCUSSION

Chemical composition of some legume-grass mixtures:

The chemical analysis of legume-grass mixtures as shown in table 1 explained that the dry matter (DM) percent of Cowpea-Millet x Napier grass hybrid mixture in the 1st or 2nd cuts was lower than Sesbania-Sudan grass or Cowpea-Millet mixtures. Crude protein (CP) percent in Sesbania-Sudan grass mixture was higher than Cowpea-Millet or Cowpea-Millet x Napier grass hybrid mixtures. The increase in CP of Sesbania-Sudan grass mixture may be due to high CP percent of Sesbania as showed by Soliman *et al* (1997) and Soliman and Haggag, (2002). The percentages of crude fiber (CF), ether extract (EE) and nitrogen free extract (NFE) of three mixtures were nearly similar. Ash percent of Sesbania-Sudan grass mixture was lower than Cowpea-Millet or Cowpea-Millet x Napier grass hybrid mixtures. The chemical composition of mixtures was nearly similar with data obtained by Gabra et al (1991) with Cowpea-Sorghum mixtures and Soliman and Haggag (2002) with Sesbania-Teosinte mixture with some slight differences. The same authors found that the chemical composition of legume-grass mixtures are intermediate between legumes and grasses. Soliman *et al.* (1997) and Soliman and Haggag (2002) found that Sesbania forage had high CP and low NFE percent compared with Teosinte grass. Generally Gabra *et al.* (1991) and Khinizy *et al.* (1997) found that Cowpea had a high content of CP and low content of CF and NFE than grasses (Sudan grass, Sorghum, Napier grass and Millet). In this respect, there are many factors affecting chemical composition as

species and varieties of forages, soil, fertilization, subsequent cuts, age of cuts and environmental condition (Gabra *et al*, 1991,Van Soest, 1996 and Haggag *et al*.,2000). Soliman *et al.* (1997) and Soliman and Haggag (2002) found that Sesbania forage had high CP and low NFE percent compared with Teosinte grass. Generally Gabra *et al.* (1991) and Khinizy *et al.* (1997) found that Cowpea had a high content of CP and low content of CF and NFE than grasses (Sudan grass, Sorghum, Napier grass and Millet). In this respect, there are many factors affecting chemical composition as species and varieties of forages, soil, fertilization, subsequent cuts, age of cuts and environmental condition (Gabra *et al*, 1991,Van Soest, 1996 and Haggag *et al*.,2000).

Table (1): Chemical composition of some legume-grass mixtures fed to lactating Zaraibi goats.

Item	DM	OM	CP	CF	EE	NFE	Ash
1st cut							
Sesbania-Sudan grass	23.31	90.15	15.85	30.34	1.97	41.99	9.85
Cowpea-Millet	22.87	88.59	14.31	29.93	2.05	42.30	11.41
Cowpea-Millet x Napier grass hybrid	20.49	89.10	14.52	29.31	2.07	43.20	10.90
2nd cut							
Sesbania-Sudan grass	25.13	89.07	16.11	31.35	2.01	39.60	10.93
Cowpea-Millet	23.53	85.99	14.85	32.43	2.07	36.64	14.01
Cowpea-Millet x Napier grass hybrid	21.30	86.25	15.03	31.95	2.11	37.16	13.75
CFM*	92.35	92.35	17.23	17.43	3.71	53.98	7.65

** Concentrate feed mixture (CFM) consists of 37% yellow corn, 30% undecortecated, Cotton seed. 20% wheat bran, 6.5% rice bran, 3% molasses, 2.5% limestone and1% common salt.*

Feed intake:

Total DM intake per head of the 1st treatment showed somewhat higher value than those reported with 2nd and 3rd groups. It might be due to increase DM and CP% of the mixture of the 1st forages in both 1st and 2nd cuts. However, the DM intake of the three groups (SS, CM and CMN) as g/kg $W^{0.75}$ or % BW was nearly similar (Table 2). In this connection, Gabra *et al.* (1991) found that DM intake of Cowpea alone or Cowpea-Sorghum mixture was higher than Sorghum alone while, the DM intake of sweet Sorghum or Sordan grasses was nearly equal. Khinizy *et al.* (1997) found that Cowpea intake was higher than Sorghum or millet grasses. The same author found that the millet intake was lower than Napier grass intake. Soliman *et al.* (1997) showed that dry matter intake of Sesbania alone or Sesbania-Teosinte mixture was higher than Teasinte. Generally, forage form about two thirds while the concentrate mixture form about one third the ration as shown in table 2. The forage concentrate ratio in the ration intake was suitable for milk production.

Table (2): Average feed Intake of lactating Zaraibi goats fed rations contained legume and grass mixtures.

Item	SS	CM	CMN
Average B.W., kg/h	39.6	38.7	39.1
Average Kg $W^{0.75}$/h	15.78	15.52	15.64
DM intake, g/h/d			
Forage mixtures	803.7	798.9	795.2
CFM	407.0	396.9	401.3
Total DM intake	1210.7	1195.8	1196.5
DM intake, g/kg $W^{0.75}$	76.72	77.05	76.50
DM intake, % BW	3.06	3.09	3.06
Forage : concentrate ratio	66 : 34	67 :33	67 : 33

SS: CFM as 1% of BW + Sesbania-Sudan grass mixture
CM : CFM as 1% of BW + Cow pea-Millet mixture
CMN: CFM as 1% of BW + Cow pea-Millet x Napier grass hybrid mixture

Digestion coefficients and nutritive values:

The digestion coefficients in table 3 explained that digestion coefficients of DM, OM, CP and EE in SS were significantly ($P<0.05$) higher than those found in CN. The differences between SS and CMN or CM and CMN were not significant in the 1st cut. The CF digestibility of CM was significantly lower than SS or CMN in the 1st cut, while the differences among three rations in the 2nd cut were not significant. The differences in NFE digestibility among the three groups were not significant. Gabra *et al.* (1991) found that digestion coefficients of DM and OM of Cowpea-Sorghum mixture was higher than Sorghum alone. Soliman *et al.* (1997) showed that digestion coefficients of all nutrients of Sesbania-Teosinte mixture + CFM was higher than Teosinte grass + CFM. On the other side, Khinizy *et al.* (1997) found that digestion coefficients of DM, OM, CF and NFE of some summer grasses as Sorghum, Millet and Napier grass were nearly similar. The total digestible nutrients (TDN) of SS tended to significant ($P<0.05$) higher than those of CM in the 1st and 2nd cuts (Table3). Moreover, differences between SS and CMN in TDN was not significant in the 1st cut and the TDN of SS was significantly ($P<0.05$) higher than those of CMN in the 2nd cut. The differences between CM and CMN was not significant with 2nd cut. The DCP showed the same previous trend with 2nd cut. The highest value showing in the 1st and 2nd cuts with group fed ration containing Sesbania-Sudan grass (SS). Gabra *et al.* (1991) found that TDN of Cowpea-Sorghum mixture and Sorghum alone were nearly similar, while DCP of Cowpea-Sorghum mixture was higher than Sorghum alone. Soliman *et al.* (1997) found that TDN and DCP of Sesbania-Teosinte mixture + CFM were higher than Teosinte + CFM. However, Khinizy *et al.* (1997) found that nutritive values as TDN and DCP of Millet and Napier grass were nearly similar. Generally, the digestion coefficients and nutritive value of the SS were higher than those report with CM and CMN in 2nd cut. The same trend was observed with 1st cut except CF digestibility. These higher value for SS might be attributed to higher CP% and decrease of ash content. The digestion coefficients and nutritive values of rations contained green forages were affected by some factors as species and varieties of forages, subsequent cuts, age of cuts, legume/grass ratio and forage/concentrate ratio.

Table (3): Digestion coefficients (%)and nutritive values (%) of the rations contained legume and grass mixtures.

Item	1st cut			2nd Cut		
	SS	CM	CMN	SS	CM	CMN
Digestion coefficients						
DM	65.22[a]	62.97[b]	63.57[ab]	67.56[a]	64.41[b]	65.77[ab]
OM	68.10[a]	65.74[b]	66.39[ab]	70.01[a]	66.71[b]	67.40[b]
CP	76.74[a]	73.37[b]	74.79[ab]	79.28[a]	75.96[b]	77.15[ab]
CF	66.89[a]	63.17[b]	70.17[a]	69.47[a]	67.91[a]	67.71[a]
EE	71.99[a]	69.75[b]	70.42[ab]	73.58[a]	69.93[b]	71.64[ab]
NFE	65.51[a]	64.54[a]	64.98[a]	66.70[a]	65.59[a]	63.35[a]
Nutritive values						
TDN	64.36[a]	61.35[b]	63.90[a]	63.14[a]	58.76[b]	58.91[b]
DCP	12.51[a]	11.21[b]	11.54[b]	13.07[a]	11.88[b]	12.04[b]

a,b Means in the same line with different superscripts differ significantly (P<0.05)

Rumen parameters:

The rumen parameters as shown in Table 4 showed that differences in ruminal pH values among three groups were not significant at 0 and 4 hrs post feeding. However, the obtained pH values are within the normal ranges for normally functioning rumen (5.5 to 7.3) as recorded by Hungate (1966). The differences in ammonia-N and total VFA,s among three rations before feeding (0 time) were not significant. Ammonia-N of SS was significantly (P<0.05) higher than CM and insignificantly higher than CMN at 4hrs post feeding, while the difference between CM and CMN was not significant at the same time. The high content of ruminal ammonia-N in SS may be due to the high content of CP in Sesbania forage as recorded by Soliman *et al.* (1997) and high protein degradability of Sesbania protein as reported by Khalili and Varvikko (1992). The total VFA,s of SS was significantly (P<0.05) lower than CM and CMN, while the differences between the two later were not significant at 4hrs post feeding. Ruminal microbial protein was not significant among three treatments at zero time and was significantly (P<0.05) higher with SS than that of CM or CMN at 4 hrs post feeding, while the difference between CM and CMN was not significant.

Table (4): Rumen parameters of lactating Zaraibi goats fed rations contained legume and grass mixtures.

Item	Time hrs.	SS	CM	CMN
pH	0	7.10[a]	6.97[a]	7.00[a]
	4	6.48[a]	6.50[a]	6.40[a]
Ammonia-N, mg/100ml	0	13.93[a]	12.83[a]	12.93[a]
	4	22.90[a]	20.70[b]	21.03[ab]
Total VFAs, mequ/100ml	0	7.70[a]	8.00[a]	8.10[a]
	4	10.60[b]	11.70[a]	11.83[a]
Microbial protein, gm/100ml	0	0.42[a]	0.40[a]	0.39[a]
	4	0.66[a]	0.57[b]	0.59[b]

a,b Means in the same line with different superscripts differ significantly (P<0.05)

The increase in microbial protein in SS may be due to the high content of ruminal ammonia-N which synthesized to microbial protein by rumen microbes. Similar findings were showed by Soliman *et al.* (1997), Gabr *et al.* (1999), Ahmed *et al.* (2001) and Fathia A. Ibrahim *et al.* (2007) in the rumen of goats.

Blood parameters:

Values of some blood parameters as shown in table 5 explained that no significant differences among three rations for blood hemoglobin, red blood cells, serum total protein, albumin, globulin, creatinine and glucose, while serum urea-N of SS was significantly higher than CM and CMN. The higher value of serum urea-N of SS may be due to higher level of ammonia-N in the rumen. However, all animals in different treatments were healthy. The obtained values were within the normal range reported by Jain (1986) and Kaneko (1989) for healthy goats and in line with the findings of Gabr *et al.* (1999) and Ahmed *et al.* (2001) in the blood of healthy goats.

Table (5): Blood parameters of lactating zaraibi goats fed rations contained legume and grass mixtures.

Item	SS	CM	CMN
Hemoglobin (Hb), g/dl	12.03[a]	11.33[a]	11.60[a]
Red Blood cells(RBC,s)x10^6/µl	13.57[a]	13.37[a]	13.50[a]
Total protein, g/dl	7.27[a]	6.97[a]	7.03[a]
Albumin, g/dl	2.83[a]	2.77[a]	2.87[a]
Globulin, g/dl	4.44[a]	4.20[a]	4.16[a]
Urea-N, mg/dl	16.17[a]	14.40[b]	14.40[b]
Creatinine, mg/dl	0.97[a]	0.87[a]	0.90[a]
Glucose, mg/dl	74.3[a]	75.3[a]	77.0[a]

a,b Means in the same line with different superscripts differ significantly (P<0.05)

Milk yield and its composition:

Data presented in Table 6 and Figure1 showed the average milk yield and its composition for the three treatments. It could be shown that the average milk yield for SS was somewhat higher than those of CM and CMN with no significant differences. Same trend was shown with protein yield. The relatively increase in milk and protein yields of SS may be due to the high content of CP in SS contained Sesbania-Sudan grass mixture. Milk composition as fat, protein, lactose, SNF and ash for the three treatments were fluctuated between them. However, the differences of milk composition among three groups were not significant. The values of milk chemical composition were nearly similar with values obtained by Gabr *et al.* (1999), Ahmed *et al.* (2001) and Fathia A. Ibrahim *et al.* (2007) of zaraibi goats with little differents due to the individual differences among goats and different feeding.

Table (6): Milk yield, milk composition and feed conversion of lactating Zaraibi goats fed rations contained legume and grass mixtures.

Item	SS	CM	CMN
Av. Milk yield, kg/h/d	1.15	1.02	1.05
Milk composition,%			
Fat	3.90	4.15	4.18
Protein	2.96	2.89	2.91
Lactose	4.61	4.69	4.67
Total solids	12.19	12.43	12.47
SNF	8.29	8.28	8.29
Ash	0.72	0.70	0.71
Av. fat yield, g/h/d	44.85	42.33	43.89
Av. protein yield, g/h/d	34.04	29.48	30.56

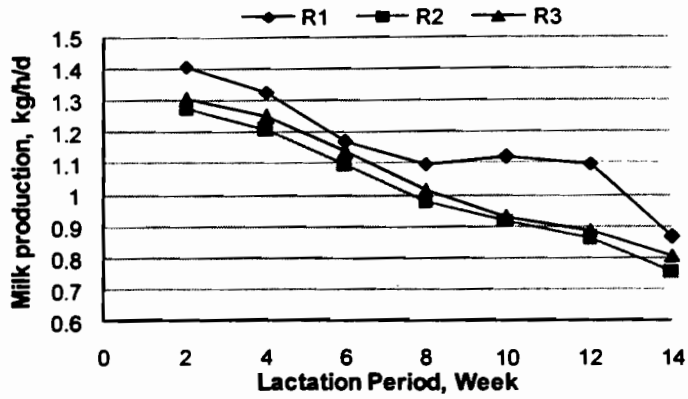

Fig. 1. Average daily milk yield of Zaraibi goats fed different rations

Feed conversion, Feed cost and Economical efficiency:

The best feed conversion as kg DM or kg TDN or kg DCP per kg milk production with the group fed Sesbania-Sudan grass mixture (SS) followed the group fed Cow pea-Millet x Napier grass hybrid mixture (CMN) as shown in Table 7. The group fed Cow pea-Millet mixture (CM) had the worst feed conversion and highest feed cost for milk production, while the feed cost of SS was nearly equal of CMN as shown in table 7. The economical efficiency of CM was lower than SS and CMN.

Table (7): Feed conversion, Feed cost and Economical efficiency of milk production of lactating Zaraibi goats fed rations contained legume and grass mixtures.

Item	SS	CM	CMN
Av. daily milk yield, kg	1.15	1.02	1.05
Av. daily DM intake, kg			
Forage mixture	0.804	0.799	0.795
CFM	0.407	0.397	0.401
Total DM intake	1.211	1.196	1.196
Feed conversion			
Kg DM/kg milk	1.053	1.172	1.139
Kg TDN/kg milk	55.42	58.88	58.49
Kg DCP/kg milk	11.12	11.32	11.23
Av. feed cost			
Forage Cost (PT/h/day)	42	37	34
CFM Cost (PT/h/day)	71	69	70
Total cost (PT/h/day)	113	106	104
Total cost (PT/kg milk)	98	104	99
Economical efficiency**	3.72	3.51	3.69

**Price of CFM = 1750 L.E./ton* ***Price of milk = 3.65 L.E./ kg*

Forage yield and cost of forage production:

Average green forage, dry matter and crude protein yields are shown in Table (8). Data revealed that the yields of green forage, DM and CP were higher for Cow pea-Millet x Napier grass hybrid mixture with both 1st and total yields than those of Cow pea-Millet mixture and Sesbania-Sudan grass mixture. On the other hand, the Sesbania-Sudan grass appeared to higher yields with 2nd cut. Increasing in yield of Cow pea-Millet x Napier grass hybrid mixture was 22.32, 9.68 and 11.02% with green forage, DM and CP, respectively compared with Cow pea-Millet mixture. The respective values recorded 42.95, 22.8 and 12.43% when compared with Sesbania-Sudan grass yield. From these results, it could be noticed that the Cow pea-Millet x Napier grass hybrid yields was the highest compared to the other groups. Cost of ton forage production of Cowpea-Millet x Napier grass hybrid mixture was less than Sesbania-Sudan grass mixture and Cowpea-Millet mixture as shown in table 8.

Table (8): Average yield (ton/feddan*) and cost of forage yield of some legume-grass mixtures.

Item	S S	CM	CMN
Green forage yield			
1st cut	10.7	15.9	20.5
2nd cut	7.7	5.6	5.8
total	18.4	21.5	26.3
Dry matter yield			
1st cut	2.49	3.64	4.20
2nd cut	1.94	1.32	1.24
total	4.43	4.96	5.44
Crude protein yield			
1st cut	0.395	0.521	0.610
2nd cut	0.313	0.196	0.186
total	0.708	0.717	0.796
Total cost,**L.E./feddan	2320	2300	2350
Forage cost			
L.E./ ton green forage	126	107	89
L.E./ ton DM	523	463	432
PT/ kg DM	52.3	46.3	43.2

**Feddan = 4200m²*

*** Total cost of feddan included soil preparation, seed price, cultivation, fertilization, irrigation and rent value.*

Conclusion:

It could be concluded that the mixtures of Sesbania-Sudan grass, Cowpea-Millet and Cowpea-Millet x Napier grass hybrid as green forages are high quantity and be available in summer season. The mixtures of Sesbania-Sudan grass and Cowpea-Millet x Napier grass hybrid had the better digestibility and feeding values. Also, the mixtures of Cowpea-Millet x Napier grass hybrid and Sesbania-Sudan grass tended to be better feed conversion and economical feed efficiency to produces one kg milk with lactating goats.

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زراعة وتقييم بعض مخاليط الأعلاف الخضراء واستخدامها فى تغذية الماعز الزرايبى الحلابة

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أجريت هذه الدراسة بهدف زراعة واستخدام ثلاثة مخاليط علفية خضراء هى:

١. السيسبان وحشيشة السودان.

٢. لوبيا العلف والدخن.

٣. لوبيا العلف والدخنابير (هجين الدخن وعلف الفيل) وقد استخدمت المخاليط الثلاثة فى تغذية ماعز اللبن الزرايبى باستخدام ١٨ ماعز زرايبى حلابة قسمت إلى ثلاثة مجموعات بكل مجموعة ٦ ماعز وغذيت على ثلاثة علائق كالآتي: المجموعة ١ غذيت على ١٪ من وزن الجسم علف مركز + السيسبان وحشيشة السودان والمجموعة ٢ غذيت على ١٪ علف مركز + لوبيا العلف والدخن والمجموعة ٣ غذيت على ١٪ علف مركز + لوبيا العلف والدخنابير وذلك لمدة ١٤ أسبوع. وكانت المخاليط العلفية تقدم للشبع. وقد تم التحليل الكيماوى للمخاليط الثلاثة كما أجريت تجارب هضم لتقييم العلائق الثلاثة باستخدام ٩ تيوس بالغة (٣ بكل مجموعة)، كما تم إجراء بعض القياسات على سائل الكرش والدم. وقد تم قياس إنتاج اللبن اليومى وأجرى له التحليل الكيميائى.

أوضحت النتائج المتحصل عليها أن نسبة البروتين الخام فى مخلوط السيسبان وحشيشة السودان كان مرتفعا عن مخلوط لوبيا العلف والدخن ومخلوط لوبيا العلف والدخنابير بينما كانت نسبة الألياف الخام ومستخلص الإثير والكربوهيدرات الذائبة متقاربة فى المخاليط الثلاثة. كان المأكول من العلائق الثلاثة متساويا تقريبا. كانت معاملات الهضم للمادة الجافة والمادة العضوية والبروتين ومستخلص الإثير للمجموعة الأولى مرتفعة معنويا عن المجموعة الثانية بينما لم تكن هناك فروق معنوية بين كل من المجموعة الأولى والمجموعة الثالثة أوالمجموعة الثانية والمجموعة الثالثة، كما كانت الفروق فى معاملات هضم الكربوهيدرات الذائبة غير معنوية بين المجموعات الثلاثة. وكانت المركبات الكلية المهضومة للعليقة الأولى مرتفعة معنويا عن العليقة الثانية فى الحشة الأولى وعن كل من العليقة الثانية والثالثة فى الحشة الثانية وكان البروتين المهضوم للعليقة الأولى مرتفعا معنويا عن العليقة الثانية والثالثة اللتين لم يكن بينهما فروق معنوية. أظهرت دراسات الكرش عدم وجود فروق معنوية فى ال pH عند صفر و ٤ ساعات بعد الأكل بينما كانت أمونيا الكرش مرتفعة معنويا مع العليقة الأولى عن العليقة الثانية وغير معنويا عن

الثالثة عند ٤ ساعات بعد الأكل، وكانت المجموعة الأولى منخفضة معنويا فى الأحماض الدهنية الطيارة ومرتفعة معنويا فى البروتين الميكروبى عن المجموعتين الثانية والثالثة عند ٤ ساعات بعد الأكل. وبالنسبة لمقاييس الدم لم تكن هناك فروق معنوية بين المجموعات الثلاثة فى كل من الهيموجلوبين وكرات الدم الحمراء أوالبروتين والجلوبيولين والألوبيومين والجلوكوز والكرياتنين فى السيرم. كان متوسط إنتاج اللبن اليومى ١.١٥ و ١.٠٢ و ١.٠٥كجم للرأس فى اليوم وكانت تكلفة التغذية ٩٨ و١٠٤ و٩٩ قرش لكل كجم لبن منتج لكل من المجموعة الأولى والثانية والثالثة على التوالى بينما لم تكن هناك فروق معنوية فى مكونات اللبن. كان محصول الفدان لكل من مخلوط السيسبان وحشيشة السودان ولوبيا العلف والدخن و لوبيا العلف والدخنابير ١٨.٤ و٢١.٥ و ٢٦.٣ طن علف أخضر و٤.٤٣ و٤.٩٦ و ٥.٤٤ طن مادة جافة و٧٠٨ و٧١٧ و ٧٩٦كجم بروتين خام على التوالى.

من هذه الدراسة يمكن استخدام مخلوط لوبيا العلف × الدخنابير وكذلك مخلوط السيسبان × حشيشة السودان بنجاح فى تغذية الماعز الحلابة بجانب ١٪ من وزن الحيوان علف مركز حيث أن هذه المخاليط أعطت أقل تكلفة اقتصادية لإنتاج ١كجم لبن.