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MILK PRODUCTION AND QUALITY OF DAIRY ZARAIBI GOATS FED *TRIFOLIUM ALEXANDRINUM* (1ST CUT) SILAGE WITH SOME CROP RESIDUES

Ahmed' M. E, E. I. Shehata, F. A. Ibrahim, K. M. Aiad, O. A. El-Zalaky
Animal Production Research Institute, Agricultural Research Center, M.O.A,, Egypt.

ABSTRACT

Forty lactating Zaraibi does were grouped into 4 feeding treatments for 19 weeks. The treatments were; G-1: concentrate feed mixture (CFM)+(70% berseem, 25% rice straw & 5% yellow corn) (S-1); G-2: CFM+(70% berseem, 25% wheat straw, & 5% YC(S-2); G-3: CFM+(70% berseem, 25% bean straw & 5% YC) (S-3); G-4: CFM+ (70% berseem, 25% corn stalk, & 5% YC) (S-4). All groups were fed on restricted amount of CFM to cover 50% of the requirements recommended by **NRC (1981)** for lactating goats. Yet, the different combinations of the four silages were fed *ad libitum*.

The main results indicated significant higher digestion coefficient of most nutrients with G-3 and G-4 compared with G-1 and G-2. Moreover, TDN and DCP values were significantly higher with G-3 and G-4 compared with G-1 and G-2. Milk yield was significantly higher with G-4 (1.397 kg/h) followed by G-3 (1.338 kg/h) then G-2 (1.190kg/h) while the lowest with G-1(1.150 kg/h). The effect of different silages studied on milk composition was not significant. But, somatic cell count (SCC) was correlated negatively with milk yield. The results indicated that there was no significant variation among different groups regarding milk quality.

The results indicated also that the highest DM intake was recorded with G-4 (89.89 g/kg $W^{0.75}$) followed by G-3 (88.40) then G2 (84..35) and the least with G-1 (83.42). In the same time, the feed conversion efficiency based on DM and TDN was better with G-3 and G-4 compared with G-1 and G-2. Economic efficiency analysis indicate that G-4 (containing corn stalk silage) was economically better than G-1 and G-2, followed by that containing bean straw silage.

Keywords: lactating goats – milk yield – milk quality – feed conversion – economical efficiency.

INTRODUCTION

The wide variation in quality and availability of animal feeds between summer and winter seasons, is the greatest stumbling block in feeding animals in Egypt. Berseem (*Trifolium alexandrinum*, L.) is the main winter forage crop in Egypt. When used alone for feeding, it contains (on dry mater basis) almost double the amount of protein required for different farm animals, has less fibers and contains high moisture, especially at the first cut **(Abd El-Sattar and Nour, 1997).** Hence, almost half of the protein of berseem clover (20% on DM basis) is wasted. Therefore, berseem clover should be fed to animals at half the rate that is presently being used during the winter season **(Naga and El-Shazly,1982)**. The other half of berseem should be preserved as hay or silage to be fed during the period of shortage in summer season.

Silage has many advantages compared to hay. It is a succulent feed, palatable and could be balanced diet in composition over the whole year **(Etman *et al.*,1994)**. Moreover, as 1st cut of Berseem clover has high moisture (more than 85%), the farmers prefer to not directly fed it to animals to avoid nutritional disorders such as bloat, soft-feces and diarrhea.

Meanwhile, the winter climate prevailed during the 1st cut of berseem occurrence does not encourage making hay. In addition, the large amounts of low quality agricultural by- products and residues produced annually in Egypt (24 million tons, **El – Shinnaway, 1998**), such as straw, hulls, corn stalks and cobs and dry by-products, could be introduced as conditioners for better preservation of silage made from succulent forages. Therefore, the objective of the present study was to find the suitable material which could be used as a conditioner for making good silage from the 1st cut of Berseem and their effect on milk production and quality of dairy Zaraibi goats.

MATERIALS AND METHODS

This study was conducted in El-Serw Experimental Station, Animal Production Research Institute, Agric Res. Center, Ministry of Agric., Egypt.

Forty lactating Zaraibi goats aging 3-6 years and weighing on average 35.5 kg were divided randomly into four equal groups (10 animals each). The experiment started three months post- kidding and continued for 14 weeks. Animals were fed 5- weeks , as a transitional period , on the tested rations before starting the experimental work.

The 1st cut of berseem was collected and mechanically chopped. Four agriculture residues; rice straw (RS), wheat straw (WS), bean straw (BS) and corn stalks (CS) were collected. The RS and CS were mechanically chopped to about 3-5 cm length, while BS and WS were used as it is. Straws were mixed at the rate of 25% with the chopped berseem (70% fresh basis) along with 5% crushed yellow corn as a source of energy to formulate the four kinds of silages. Ensiling was done in cement pits (1.5X 4.0 X1.0 m), which were tightly covered by plastic sheets followed by approximately 20 cm layer of soil to maintain anaerobic condition. The ensiling was lasted for 40 days. Samples were taken, before use of silage, to test the physical and fermentative characteristics and for chemical analysis. All groups were fed on restricted amount of concentrate feed mixture (CFM) to cover 50% of the requirements recommended by **NRC (1981)** for lactating goats, while different silages were fed *ad libitum*. Accordingly rations tested were, CFM+(silage consisted of 70% berseem-25% rice straw-5% yellow corn)(G-1), CFM+(silage consisted of 70% berseem-25% wheat straw -5% yellow corn) (G-2) ,CFM+(silage consisted of 70% berseem-25% bean straw- 5% yellow corn) (G-3) and CFM+(silage consisted of 70% berseem-25% corn stalks -5% yellow corn) (G-4). CFM was formulated of 30%undecorticated cotton seed meal, 37%yellow corn, 20% wheat bran, 6.5% rice bran, 3% molasses, 2.5% limestone and 1% common salt ,

The proximate chemical analysis of tested materials and faeces was carried out according to the standard procedures of the **AOAC (1995).** Fiber fractions (NDF, ADF and ADL) of tested ingredients as well as silages were determined according to **Robertson and Van Soest (1981**). Cellulose (ADF%-ADL%) , and hemicellulose (NDF%-ADF%) contents were calculated by difference.

The daily milk yield was recorded for each doe in all tested groups. Representative milk samples, about 0.5% of total milk produced, were taken biweekly for each doe, from the morning and evening milking of the same day. Then the samples were accumulated and analyzed for total solids (TS), fat, protein, solid non fat (SNF) and ash while pH and acidity were determined as given by **Ling (1963)**; milk lactose content was assessed as described by **Barnett and Abdel- Tawab (1957)**. Fresh samples of whole goat's milk from different treatments were divided into two parts. The first part was incubated at 30^0C for 5 hours, while the second part was heated at 90 ^{0}C for 15 seconds then cooled to 30 ^{0}C and inoculated with 1% yoghurt starter culture and incubated at 30^0C for 5hs. Economic efficiency was calculated, as total output/ total input according to the available local prices (where 1 ton of RS,WS, BS, CS, CFM and YC cost L.E. 100, 250, 250, 100, 850 and 1000 while berseem cost LE 100/ton and 1kg milk cost 3.25 LE). After finishing the feeding trials, 12 bucks with average live body weight of 45.0 kg were used in four digestion trials (3 animals each) to test the four experimental diets. Each digestion trial lasted for 6 weeks, of which 5 weeks as a preliminary period followed by 7 days collection period. At the end of the collection period of each digestion trial, rumen liquor samples were taken from each animal in each treatment before feeding and at 4 and 8 hours post- feeding using a rubber stomach tube. The collected rumen liquor was filtered through two layers of gauze without squeezing for the determination of pH value and NH3-N concentration **(Conway, 1957**), total volatile fatty acids (TVFA's) as described by **Warner (1964)**, microbial protein (**Schultz and Schultz, 1970**) and protozoa' number (**Abou Akkada and El-Shazly ,1964**).

Data were statistically analyzed according to **Snedecor and Cochran (1982)** while the differences among means were tested using Duncan's Multiple Range Test (**Duncan, 1955**).

RESULTS AND DISCUSSION

The chemical composition and fiber fractions of the tested ingredients and obtained silages are presented in Tables 1 and 2. It appeared that corn stack (CS) and bean straw (BS) and their silages (S-4 and S-3) had the highest OM and CP, while the lowest values were observed with rice straw (RS) and wheat straw (WS) and their silages (S-1 and S-2). It was noticeable that the chemical composition of the conditioner materials used herein was greatly affected the silage involved them. Fiber fractions components varied widely among tested materials and their silages. The four silage types had pleasant aroma, natural colour and pleasing taste. Data in Table (3) indicate that pH values of all silages ranged between 4.21 (S-4) to 4.40 (S-1) which seems to be within the normal range of good quality silage as reported by **Hellberge (1963)**. Total VFA's concentration was practically similar for all silages indicating that all tested agricultural by - products created similar silage fermentation conditions. However, the highest value of lactic acid was recorded with S-4 (1.79%) and the lowest with S-1(1.58%). Also, the highest butyric, isobutyric and propionic acids concentration were observed in S-1.

Data of the digestibility trials presented in Table (4) show that digestion coefficients of DM, OM and CP of G-1 and G-2 were significantly ($P < 0.05$) lower than those of G-3 and G-4. This may be attributed to increasing ADF concentration in S-1 and S-2 than the other silages. It is interesting to note a negative relationship between silage digestibility and ADF concentration (**Jung and Allen, 1995**). At the same time, TDN and DCP values were significantly ($P < 0.05$) higher with G-3 and G-4 compared with G-1 and G-2. The highest value of DCP was recorded with G-3 (7.68) then G-4 (7.27) and finally G-1 (6.23) and G-2 (6.17%),

Table (1): Chemical composition (%) and cell wall constituents (%) of tested ingredients (on DM basis).

Feedstuff / Components	Agricultural by- products				Berseem	yellow corn
	Rice straw	Wheat straw	Bean straw	Corn stalks		
DM	91.35	90.97	89.33	90.87	10.39	91.11
OM	81.50	82.90	84.95	88.97	90.07	98.29
CF	37.40	38.05	37.0	35.53	24.51	2.53
CP	3.25	3.10	5.51	4.71	15.85	8.51
EE	1.63	1.75	1.21	1.59	2.71	4.19
NFE	39.22	40.00	41.23	47.14	47.00	83.06
ASH	18.5	17.10	15.05	11.03	9.93	1.71
Fiber fractions:						
NDF	72.2	75.7	66.9	70.10	55.3	-
ADF	51.3	49.5	47.9	43.8	41.3	-
ADL	7.9	9.2	10.0	7.2	6.7	-
Hemicellulose	20.9	26.2	19.0	26.3	14.0	-
Cellulose	43.4	40.3	37.9	36.6	34.6	-

Table (2): Chemical composition (%) and cell wall constituents (%) of different types of silages and concentrate feed mixture (on DM basis)

Chemical composition	Silages				Concentrate feed mixture
	S-1	S-2	S-3	S-4	
DM	28.91	31.53	30.71	33.03	91.07
OM	86.08	87.25	88.67	90.49	93.50
CF	29.60	30.2	29.0	27.53	15.93
CP	6.47	6.33	8.63	7.95	14.71
EE	2.08	2.14	1.73	2.05	3.61
NFE	47.93	48.57	49.31	52.96	59.25
Ash	13.92	12.75	11.33	9.51	6.50
Fiber fractions:					
NDF	59.91	63.02	56.83	57.52	47.50
ADF	40.35	38.91	37.57	35.72	12.57
ADL	6.95	7.65	8.51	6.7	5.15
Hemicelluese	18.56	24.11	19.26	21.8	34.93
Cellulose	33.40	31.26	29.06	29.02	7.42

Table (3): Quality parameters of different silages

Items	Silages			
	S-1	S-2	S-3	S-4
pH value	4.40	4.33	4.37	4.21
Lactic acid	1.58	1.61	1.65	1.79
VFA's fractions as (%) of fresh basis:				
Acetic acid	0.93	0.98	0.97	1.02
Propionic a.	0.26	0.27	0.27	0.22
Isobutyric a.	0.27	0.25	0.20	0.21
butyric a.	0.24	0.21	0.24	0.18
Total VFA's %	1.70	1.71	1.68	1.63

which mainly due to the decrease of CP content and CP digestibility in silage containing rice straw (S-1) and wheat straw (S-2) compared with the other silages. Generally, feeding value of rations is a resultant of amounts consumed and their digestibility coefficients (**Horn *et al.*, 1979** and **Lippke, 1980**) and /or the cell wall constituents (CWC) and their digestion coefficients (**Allinson and Osbourn, 1970**).

Results in Table (5) showed that differences among the four silages were not significant in pH values before feeding (0 time) and at 4 and 8 hrs post feeding. The maximum pH values were recorded at 0 hr and decreased to the minimum at 4hr post feeding then tended to increase again at 8 hr. Similar trend had been reported by **Abdelhamid *et al.* (2004).**

Table (4): Digestion coefficients (%) and feeding values (% DM basis) of the tested diets by Zaraibi bucks

Item	Groups			
	G-1	G-2	G-3	G-4
Digestion coefficients (%):				
DM	60.34±1.01 [b]	61.31±0.94 [b]	64.26±0.81 [a]	65.06±0.66 [a]
OM	62.95±0.88 [b]	64.04±0.66 [b]	67.02±0.90 [a]	68.10±0.70 [a]
CF	56.65±1.39 [b]	58.18±0.54 [ab]	59.71±0.64 [a]	60.01±0.57 [a]
CP	63.25±0.81 [b]	63.75±0.16 [b]	69.40±0.74 [a]	68.24±1.58 [a]
EE	70.29±0.80	71.75±0.54	71.00±0.81	73.41±1.40
NFE	65.38±0.96 [c]	66.44±0.63 [bc]	69.61±1.41 [ab]	71.16±0.82 [a]
feeding value (%):				
TDN	58.48±0.80 [b]	59.93±0.61 [b]	62.93±0.84 [a]	64.89±0.68 [a]
DCP	6.23±0.08 [c]	6.17±0.02 [c]	7.68±0.08 [a]	7.27±0.17 [b]

Means in the same row with different superscripts differ significantly at ($P < 0.05$).

Ruminal NH3-N concentration (Table 5) tended to increase with G-3, especially at 4 and 8 hrs (27.6 and 24.4 mg/100 ml, respectively) which might be attributed to the increasing CP content of bean straw and their silage (S-3) as shown in Tables 1 and 2. Ruminal TVFA's concentrations were the highest ($P< 0.05$) with G-4 (11.2) followed by G-3 (10.7) and the lowest ($P< 0.05$) with G-2 (10.2) and G-1 (9.9 m Eq./100ml).The same trend was observed with protozoa number as shown in Table (5). In the same time, microbial protein (g/100 ml) was significantly lower with G-1 (0.37) compared with G-3 (0.46) and G-4 (0.45). Thus, the highest values of nitrogen free extract (NFE), crud protein (CP) content (Table 2) and silage quality (Table 3) that recorded in S-3 and S-4 and reflected on increasing total VFA's, protozoa number and microbial protein were succeeded to improve the rumen environment as reported by **Ahmed (1995)**.

The average milk yield of lactating Zaraibi does are presented in Table (6). The obtained results indicated that it was significantly higher with G-3 and G-4 compared with G-1 and G-2 during most experimental period. The highest yield (136.9 kg) was recorded with G-4 followed by G-3 (131.1 kg) then G-2 (116.6 kg), while the lowest value was detected Table (5): Rumen fermentation parameters of Zaraibi goats fed the experimental rations.

Items	Hrs	Groups			
		G-1	G-2	G-3	G-4
pH	0	6.9±0.1	6.9±0..2	7.1±0.1	7.1±0.1
	4	6.5±0.1	6.6±0.1	6.6±0.0	6.6±0.1
	8	6.6±0.1	6.7±0.1	6.8±0.0	6.7±0.0
Ammonia-N(mg/100ml)	0	15.7±0.9	15.3±0.8	16.8±0.7	16.7±0.9
	4	26.1±1.1	26.7±1.6	27.6±1.0	27.2±0.8
	8	22.1±0.3	22.8±0.3	24.4±0.4	23.3±0.9
Total VFA's (mEq./100ml)	4	9.9±0.2 c	10.2±0.1 c	10.7±0.1 b	11.2±0.1 a
Total No. of protozoa (x 10^3 /ml)	2	532±11.7 b	569±17.5 b	610±20.8 a	627±10.4 a
Microbial protein (g/100ml)	4	0.37±0.0 c	0.39±0.0 bc	0.46±0.0 a	0.45±0.0 ab

Means in the same row with different superscripts differ significantly at (P< 0.05)

Table(6): Average ± standard error of milk yield (kg/day)as affected by the experimental diets.

Group	W-2	W-6	W-10	W-14	Total Yield, 14 weeks
G-1	1.29±0.03 b	1.19±0.02 b	1.09±0.04 b	1.02±0.05 c	112.7 b
G-2	1.32±0.04 b	1.22±0.03 b	1.14±0.04 b	1.06±0.04 bc	116.6 b
G-3	1.51±0.07 a	1.44±0.05 a	1.27±0.05 a	1.10±0.03 b	131.1 a
G-4	1.56±0.05 a	1.47±0.04 a	1.34±0.05 a	1.19±0.03 a	136.9 a

Means in the same row with different superscripts differ significantly at (P< 0.05)

with G-1 (112.7 kg) and the differences were significant (between G-1 & G-2 vs. G-3 & G-4).

The superiority of milk yield in G-3 and G-4 could be associated with the higher feeding value (Table 4) and digested nutrient intake (Table 10). Concerning milk composition (Table 7), the obtained data indicated that differences in milk composition among the four rations were not significant, where it ranged from 4.14 to 4.22% for fat, 2.82 -2.9% for protein, 4.65 – 4.76% for lactose. The obtained milk yield and composition for Zaraibi goats are in agreement with those reported by **Ahmed (1999), Ahmed *et al.* (2001) and Shehata *et al.* (2004 and 2007).**

Table (7):Milk composition of lactating Zaraibi does fed different tested rations

Items	Groups			
	G-1	G-2	G-3	G-4
Fat %	4.14±0.05	4.18±0.07	4.21±0.04	4.22±0.04
Protein %	2.82±0.02	2.87±0.06	2.90±0.06	2.87±0.06
Lactose%	4.71±0.02	4.65±0.02	4.73±0.01	4.76±0.01
Total solids%	12.47±0.06	12.44±0.09	12.62±0.07	12.58±0.09
Solids non fat (SNF)%	8.28±0.03	8.28±0.06	4.46±0.07	8.36±0.06
Ash%	0.75±0.003	0.75±0.002	0.77±0.005	0.76±0.007
Somatic cell count.(SCC)x10^3	a 405±12	ab 385±18	b 341±11	b 323±14

Means in the same row with different superscripts differ significantly at (P< 0.05)

Somatic cell counts (SCC) (Table 7) were significantly lower with G-3 and G-4 compared with G-1. The highest value of SCC was recorded with G-1(405000) followed by G-2 (385000) then G-3 (341000) and lastly, the lowest value was recorded with G-4 (323000). It is interesting to note a negative relationship between SCC and milk yield. In this respect, **Baro *et al.* (1994) and Bedo *et al.* (1995)** found that SCC correlated negatively with milk yield.

Table (8) showed increased acid development in raw goat's milk and milk inoculated with yoghurt starter culture for all treatment groups. Therefore, development of acidity proved that goats' milk from different treatments is suitable for manufacturing fermented dairy products such as cheese, yoghurt and cultured milk. These results agree with those of **Enab (1993) and Ayad (2003).** Natural milk pH and pH of milk inoculated with yoghurt starter were decreased along with incubation period. This observation proved the suitability of goat's milk for growth and biochemical activity of starter microorganisms where it agree with those obtained by **Youssef (1989) and El-Alamy *et al.*(1991).**

The fresh whole goats' milk of different treatment groups was divided into 2 sections (Table 9), the first section included the fresh whole raw goats' milk, heated to 30 ^{0}C and rennet was added. The second section, included whole goats' milk of all treatment groups, was heated to 72 ^{0}C then cooled to 30 ^{0}C and 1% of multiplied mixed strain yoghurt starter culture was added to it.

Table (8): Acidity and pH development (%) of goat's milk (natural and inoculated with (1%) yoghurt starter.

Groups	Incubation period (hours)											
	Acidity						pH					
	0	1	2	3	4	5	0	1	2	3	4	5
Raw milk												
G-1	0.156	0.170	0.200	0.22	0.30	0.45	6.62	6.51	6.40	6.37	6.32	5.60
G-2	0.160	0.170	0.200	0.23	0.31	0.45	6.60	6.51	6.40	6.34	6.30	5.60
G-3	0.162	0.180	0.210	0.24	0.31	0.46	6.60	6.45	6.38	6.36	6.30	5.53
G-4	0.163	0.200	0.240	0.27	0.33	0.48	6.58	6.40	6.30	6.09	5.23	5.64
Yoghurt starter												
G-1	0.153	0.160	0.200	0.386	0.602		6.67	6.62	6.40	5.70	4.93	
G-2	0.156	0.166	0.206	0.448	0.641		6.62	6.55	6.34	5.84	4.82	
G-3	0.160	0.172	0.230	0.448	0.653		6.60	6.42	6.38	5.84	4.76	
G-4	0.162	0.175	0.240	0.452	0.673		6.60	6.38	6.30	5.72	4.68	

Table (9): Effect of experimental rations on RCT, TC, whey syneresis and fat loss of whey in goat's milk

Groups		RCT min:sec	CT (gram)	Whey syneresis					Fat loss of whey %
				10	30	60	90	120	
Section 1	G-1	2:43	36.110	38.110	38.170	47.320	54.410	57.200	0.55
	G-2	2:21	44.003	27.683	41.836	51.654	54.936	57.092	0.50
	G-3	2:20	41.937	31.521	45.028	53.405	56.813	58.221	0.50
	G-4	2:25	43.450	32.338	46.835	54.686	57.527	58.561	0.55
Section 2	G-1	210:00	28.101	20.112	31.460	36.320	41.610	51.830	0.60
	G-2	210:00	29.336	22.294	34.041	40.051	43.052	54.353	0.55
	G-3	210:00	26.876	18.363	31.209	38.326	42.142	44.963	0.55
	G-4	210:00	22.975	19.470	27.910	35.960	40.310	55.060	0.50

RCT: Rennet coagulation Time
CT: Curd Tensio

There were no significant differences among the variable treatment groups (Table 9), in the first section, regarding Rennet Clotting Time (RCT) while in the second section, RCT was 210 minutes for all treatment groups. This may be due to effect of the starter on acidity development provided in the forming curd. Concerning Curd Tension (CT) and whey syneresis, the raw goats' milk (First section) revealed higher values than when starter was added (Second section). These differences may be attributed to increase protein content of goats' milk as affected by the acidity of milk and curd **(Dimov and Mineva, 1963)**. The percentage of fat loss in the whey was found to be nearly similar in the treatments of the two sections. These results were consistent with the results of **Emara, (1990); Nasr *et al*, (1990); El- Alamy *et al.*, (1992); Enab, (1993) and Mehana *et al.*, (1998).**

Feed conversion and economical efficiency data, calculated from the feeding trials on lactating does, are presented in Table (10). The highest DM intake (g/kg $W^{0.75}$) was recorded with G-4 (89.89) followed by G-3 (88.40), whereas G-1 recorded the lowest value (83.42). The feed conversion efficiency, kg DM intake that produce kg milk, was better with G-4 (0.923) and G-3 (0.951) compared to G-1(1.063) and G-2 (1.046) as shown in Table (10). Similar trend was noticed with the efficiency of feed conversion based on TDN. The feed costs per kg milk were L.E. 0.777, 0.803, 0.737 and 0.639 for G-1 , G-2 ,G-3 and G-4, respectively as shown in Table (10). Thus, the economic efficiency was the best with corn stalk silage (G-4, 5.09) then bean straw silage (G-3, 4.41), rice straw silage (G-1, 4.19) followed by silage containing wheat straw (G-2, 4.05).

Table (10): Feed intake and economic efficiency for lactating Zaraibi does fed different experimental diets.

Item	Groups			
	G-1 (RS)	G-2 (WS)	G-3 (BS)	G-4 (CS)
Number of does	10	10	10	10
Body weight, kg	35.89	36.21	35.03	34.83
Av. milk yield (g/d)	1150	1190	1338	1397
Av. feed intake (DM base) during feeding trial:				
from CFM, g/d	598	607	614	619
from silage ,g/d	625	638	659	670
Total DM intake, g/d	1223	1245	1273	1289
DM intake, g/kgw$^{0.75}$	83.42	84.35	88.40	89.89
DM intake ,g/kg BW	34.08	34.38	36.34	37.01
TDN intake, g/d	715.2	746.1	801.1	836.4
DCP intake, g/d	76.19	76.82	97.77	93.71
Feed conversion efficiency:				
kg DM /kg milk	1.063	1.046	0.951	0.923
kg TDN/ kg milk	0.622	0.627	0.599	0.599
Economic efficiency:				
Intake as fed , g/d				
CFM	657	667	674	680
Silage	2162	2023	2146	2028
Cost of feed consumed, LE/h	0.893	0.956	0.986	0.892
Price of milk produced, L.E/h	3.738	3.868	4.349	4.540
Feed cost/ kg milk, L.E	0.777	0.803	0.737	0.639
Economically efficiency	4.19	4.05	4.41	5.09

CONCLUSION

This study highlights the high economic of producing milk from goats as estimates show L.E. 0.932 for input vs. L.E 4.124 for output. This wide profit margin could reduce the risk of increasing feeding cost start to be prevailing nowadays. All roughages tested have reasonable impact, when involved in making silage, in reducing feeding cost but the best is corn stalk silage then bean straw silage.

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إنتاجية اللبن وخصائصه من الماعز الزرايبى الحلاب المغذى على سيلاج برسيم الحشة الأولى المزود بأنواع مختلفة من الأتبان

محمد إبراهيم احمد، عصام الدين إبراهيم شحاتة، فتحية عبد العظيم إبراهيم، كامل محمد عياد، أسامة عزمى الزلاقى.
معهد بحوث الانتاج الحيواني – مركز البحوث الزراعية- وزارة الزراعة – مصر

تم توزيع عدد ٤٠ عنزة زرايبى حلاب على ٤ مجموعات غذيت لمدة ١٩ أسبوعا على العلف المصنع والسيلاج المنتج من برسيم الحشة الأولى (بنسبة ٧٠%) مع بعض المخلفات الزراعية (بنسبة ٢٥%) وهى قش الأرز (مج١) وتبن القمح (مج٢) وتبن الفول (مج٣) وعيدان الأذرة المطحونة (مج ٤) مع إضافة ٥% أذرة صفراء مطحونة للسيلاج ، وقد تم تغذية الحيوانات على ٥٠% من احتياجاتها طبقا لمقررات (NRC) لعام ١٩٨١ من العلف المصنع في حين تم تقديم انواع السيلاج المختبرة حتى الشبع.

وقد أظهرت النتائج تحسن معظم معاملات الهضم مع مج٣، مج٤ مقارنة مع مج١، مج ٢ وكانت الاختلافات معنوية وبالمثل كان هناك تفوق معنوى في القيمة الغذائية متمثلة في المركبات المهضومة الكلية والبروتين المهضوم لكل من مج٣، مج٤ مقارنة بـ مج١، مج٢.

فيما يتعلق بإنتاج اللبن اليومى، فقد سجلت المجموعة الرابعة أعلى قيمة (١,٣٩٧ ك جم) وتلتها مج٣ (١,٣٣٨ كجم) ثم مج٢ (١,١٩٠ ك جم) وأخير المجموعة الأولى حيث حققت حليب يومى قدره ١,١٥٠ك جم ،والتفوق كان معنويا لكل من مج٣ ، مج٤ مقارنة مع مج١ ، مج٢ . أما مكونات اللبن فلم تتأثر مع اختلاف المعاملات الغذائية للماعز الحلاب، لكن عدد الخلايا الجسدية انخفض معنويا مع ارتفاع اللبن في المجموعة الرابعة لتظهر علاقة عكسية بين محصول اللبن وعدد الخلايا الجسدية، في حين أن قياسات جودة اللبن أظهرت انه لا توجد اختلافات معنوية بين المجموعات.

وقد أظهرت قياسات كفاءة التحويل الغذائي المقدرة على أساس المادة الجافة والمركبات المهضومة الكلية أن أفضلية التحويل كانت لصالح المجموعة الثالثة والرابعة، وعند الأخذ في الاعتبار أسعار المدخلات والمخرجات كانت الكفاءة الاقتصادية لصالح المجموعة الرابعة التي تحتوى سيلاج عيدان الأذرة (٥,٠٩) ثم المجموعة الثالثة والتي تحتوى سيلاج تبن الفول (٤,٤١) ثم المجموعة الأولى المغذاة على السيلاج المخلوط بقش الأرز (٤,١٩) في حين كانت أقل كفاءة مع مج٢ (٤,٠٥) المغذاة على السيلاج المخلوط بتبن القمح.