J. Agric. Sci. Mansoura Univ., 29(2): 595 - 608, 2004

PRODUCTIVE PERFROMANCE OF ZARAIBI GOATS FED RATIONS CONTAINING SOME MIDICINAL HERBS

Zied ,A.M.M. and M.E. Ahmed

Animal Production Research Institute, Agricultural Research Center, Dokki, Giza, Egypt.

ABSTRACT

This work was carried out on Zaraibi goats to investigate the effect of using some medicinal herbs (chamomile and thyme) on milk production, feed conversion and economical efficiency as well as some rumen and blood parameters. Thirty pregnant Zaraibi goats aged 3-6 years old and weighing on average 55.0 kg were used. Animals were divided randomly into 3 equal groups (10 in each). Animals received diets in groups. Zaraibi does in G1 received concentrate feed mixture, berseem hay and rice straw as a control diet, while those in G2 and G3 received the control diet plus 60 mg chamomile and thyme/kg body weight daily, respectively. In addition, 9 bucks were used to evaluate the digestibility and nutritive values of the tested rations.

The results showed that both of chamomile and thyme in the tested rations led to significant increase in digestibility (of most nutrients) and nutritive value (TDN and DCP). The daily milk yield was the highest (1.586 kg) with G2 followed by G3 (1.540kg) and lastly the control (G1) which recorded the lowest value (1.407kg) and the differences were significant ($P < 0.05$). However, milk composition was not significantly affected by both chamomile and thyme. In the sametime, using medicinal herbs (in G2 and G3) had positive effect on feed conversion, based on DM, TDN and DCP. Moreover, the economical efficiency was improved with chamomile (G2) and thyme (G3) by 11.80 and 8.43% compared with G1.

The results of rumen parameters of Zaraibi goats showed that pH value and ammonia -N were not significantly differed among the groups. Addition of medicinal herbs especially chamomile had significantly increased total volatile fatty acids (TVFA's) concentration at 4 and 6 hr post feeding in rumen fluid of goats. Serum total lipids and cholesterol were reduced while protein and triglyceride were increased as a result of adding both chamomile and thyme in goat's rations.

Accordingly, it could be concluded that using both chamomile and thyme in goat's rations had positive effects not only in improving milk yield, but also in improving feed utilization and economical efficiency without any adverse effect on milk composition as well as rumen and blood parameters.

Keywords: Zaraibi goats- medicinal herbs-milk production - milk composition - feed conversion - economical efficiency- rumen and blood parameters.

INTRODUCTION

There are a large number of feed additives available for inclusion in animal rations to improve animal performance. However, the use of chemical products especially hormones and antibiotics may cause unfavorable side effects. Moreover, there is evidence indicating that these products could be considered as pollutants for humans and threaten their health on the long-run. So, the World Health Organization (WHO) encourage the worldwide trend to return to the nature and minimize using synthesized chemicals. Accordingly, many attempts were carried out to use natural materials such as medicinal plants which widely accepted as feed additives to improve the

efficiency of feed utilization and animal's productive performance. In the meantime, using medicinal herpes as feed additives was the preventive solution to avoid the hazard of side effects using chemicals. Row material of these herbs and their extracts and drugs proved to be safe always (Singh et al., 1993; Zeid, 1998; Kholif ,2000 ; Ayyad ,2003 and Mohamed *et al.*, 2003).

Aromatic plants are available in Egypt, since 37347 Feddan are cultivated by aromatic plants produced 84795 tons/year (Wideneki *et al.*, 1998). Several studies showed that adding medicinal plants and herbs to the diets of sheep (Aboul-Fotouh *et al*, 1999 and Allam *et al.*, 1999) improved their feed intake, nutrient digestibility and also milk production (El-Saadany et al, 1996 and Zeid, 1998). Furthermore, different investigation reported the effect of these supplementations on some blood biochemical parameters in buffaloes (Youssef *et al.*, 1998), sheep (Korshom *et al.*, 1998) and in kids (El-Hosseiny *et al.*, 2000). Abou- Zeid (1986) mentioned that chamomile is used for cold relief, anti-fever, spasms relief, anti mouth and stomach ulcers, anti-fungal diseases. Mericli (1990) recorded that chamomile has anti-inflammatory, anti-septic and spasmolytic activities. Fritz *et al* (1992) found that chicken's ration contained 2-3 % herbs mixture (included 30% chamomile) improved feed conversion.

Thyme and its volatile oil have a markedly tonic effect, supporting the body's normal function and countering the effects of aging. The antiseptic and tonic properties of thyme make it a useful tonic for the immune system in chronic, especially fungal, infection as well as an effective remedy for chest infections, such as bronchitis and pleurisy. Also, it is helpful in hay fever (Chevallier, 1996).

Therefore, the main objectives of the present work were to study the effect of chamomile and thyme on digestibility and milk production as well as feed conversion and economical efficiency. Some rumen parameters and blood constituents as affected by dietary treatments were also studied.

MATERIALS AND METHODS

The present study was conducted at El- Serw Experimental Research Station, Animal Production Research Institute, Agricultural Research Center. Thirty pregnancy Zaraibi goats in the 2nd ,3rd and 4th seasons of lactation, aging 3-6 years and weighing on average 55.0kg were divided randomly into three equal groups, 10 goats each. They were selected from El- Serw Station Herd. The animals were in the late pregnancy period (end of the 4th month of pregnancy) and continued for nine months of lactation. Animals were weighed at the beginning and thereafter at two-weeks intervals. The animals fed two weeks as a transitional period on the same rations before the start of the experimental work.

Animals received diets in groups. Zaraibi does in G1 received concentrate feed mixture, berseem hay and rice straw as a control diet, while those in G2 and G3 received the control diet plus 60 mg chamomile and thyme /kg body weight daily, respectively. Feeding allowances of protein and energy were calculated according to NRC (1981).The amounts of concentrate feed mixture (CFM) and roughage (berseem hay, BH and rice straw, RS)

were estimated to cover 60 and 40% of dry matter intake, respectively. The used CFM contained; undecorticated cottonseed meal (11.0%), yellow maize (41%), soybean meal (5.0%), wheat bran (25%), molasses (5%), rice bran (9%), limestone (2.5%), common salt (1%) and minerals mixture (0.5). The chemical analysis of the CFM, BH and RS is shown in Table (1).

The daily milk yield was recorded for each goat. Representative milk samples (about 0.5% of total milk produced) were taken once monthly from each goat, from the morning and evening milkings of the same day. Then the samples were composed and analyzed for total solids (TS), fat, protein, solid-non fat (SNF) and ash according to Ling Procedures (1963), while milk lactose was calculated by difference.

Feed conversion efficiency expressed as Kg DM, TDN or DCP required for yielding on kg milk. The economical efficiency was calculated as the ratio between output (price of milk yield) and cost of feed consumed.

Ruminal fluid samples were taken using stomach tube before and post-feeding (2,4 and 6 hrs) at the end of feeding trials. The samples were filtered through 3 layers of gauze and directed to the determination of pH-value. Ammonia nitrogen (NH_3-N) concentration was measured according to Conway (1957) while the total volatile fatty acids (VFA's) were measured according to the technique described by Warner (1964).

Blood samples were collected from the jugular vein from does of each group once at the end of the experiment. Blood samples were separated by centrifugation at 4000 rpm for 20 minutes, then frozen at -20C until analysis for total protein, creatinine, glucose, cholesterol, total lipids, triglyceride and urea using commercial kits and the methods reported by biochemistry (Biomerieux) laboratory reagents and products.

In addition, three digestibility trials were conducted on 9 Zaraibi bucks averaged 37.22 kg body weight. Zaraibi bucks were divided into 3 equal groups (three bucks each) to receive the three mentioned diets. Each digestibility trial lasted for 47 days, at which 40 days were considered as a preliminary period for adapting the animals to the tested rations, followed by 7 days as a collection period. The rations were offered twice daily at 8 am. and 3 pm. while water was available all the day. Samples of feeds and feces were analysed according to A. O. A. C. procedures (1995). The statistical analysis was performed using the least squares method described by Likelihood programme of SAS (1994). The differences among means were tested according to Duncan's New Multiple Rang Test (Duncan, 1955).

RESULTS AND DISCUSSIONS

1- Digestibility trials:

Table 1 presents the proximate chemical analysis of the ingredients used in the present study. The calculated chemical compositions of the experimental rations show that all the tested rations had similar contents of all nutrients.

Table (1): Chemical composition (% on DM basis) of feed ingredients and experimental rations

Feed	DM	Chemical composition					
		OM	CF	CP	EE	NFE	Ash
Concentrate feed mixture	90.83	94.45	11.10	14.03	3.65	65.67	5.55
Berseem hay	89.09	86.95	30.17	11.00	2.17	43.61	13.05
Rice straw	90.85	81.90	38.56	3.15	1.53	38.66	18.10
Calculated chemical composition of experimental rations							
Ration -1 (G1)	90.42	90.63	20.10	11.54	2.96	56.03	9.37
Ration -2 (G2)	90.43	90.66	19.99	11.57	2.95	56.15	9.34
Ration - 3 (G3)	90.41	90.62	20.10	11.55	2.96	56.01	9.38

G1: control, G2: chamomile treatment (60mg/ kg BW), G3: thyme treatment (60mg/kg BW)

Percentages of digestion coefficients of all nutrients were improved with both chamomile (G2) and thyme (G3) than with the control group (G1). These positive effects were significant in digestibility of all nutrients (except EE digestibility) as a result to presence of chamomile in goat's rations (G2). But, G3 showed significant improvement in digestibility of OM, CF, CP and NFE alone compared to the control group (G1). Moreover, the TDN and DCP values significantly increased with the presence of medicinal herbs (chamomile and thyme) in goat's rations (G2 and G3) as shown in Table (2). At the sametime, it was noticed that the highest values in digestion coefficients of all nutrients as well as TDN and DCP were recorded with chamomile treatment (G2) followed by thyme treatment (G3) and finally, the lowest values were recorded with the control treatment (G1). The improvement in digestibility and nutritive value with the presence of medicinal herbs especially chamomile flowers may be due to the role of the active ingredients that function as an antiseptic against the antagonistic flora and stimulate the digestive enzymes and processes (Abou- Zeid, 1986, Khanna et al., 1993 and McIntyre, 1995). These results indicated the positive effect of some medicinal herbs on digestibility and consequently, the nutritive values of rations, which agreed with the results reported by Allam et al. (1999). Recently, El- Saadany et al. (2003) observed that the highest values of DM, OM, CF, CP and NFE digestibility and nutritive values were recorded with chamomile treatment compared with other additives and the control as well.

Table (2) : Digestibility coefficients and nutritive value of Zaraibi bucks as affected by the experimental treatments.

Items	Treatments			±SE
	G1	G2	G3	
DM intake:				
g/h /d	700.5	730.7	712.5	4.39
g/ $kgw^{0.75}$	47.07	47.73	47.50	0.31
g/kg BW	19.13	19.25	19.23	0.16
Digestion coefficients %:				
DM	57.78^{b}	62.01^{a}	59.29^{ab}	0.68
OM	61.14^{b}	65.79^{a}	64.64^{a}	0.72
CF	51.55^{b}	56.36^{a}	55.94^{a}	0.81
CP	64.21^{b}	70.00^{a}	68.05^{a}	0.89
EE	69.42	71.03	70.92	0.33
NFE	63.50^{b}	68.10^{a}	66.72^{a}	0.73
Nutritive value %:				
TDN	57.96^{b}	62.29^{a}	61.20^{a}	0.67
DCP	7.39^{b}	8.07^{a}	7.86^{a}	0.10

a to b of the same row with different superscripts are significantly different ($P \leq 0.05$).

The data of water intake are presented in Table (3). The water intake expressed as ml/head, ml/ $kgw^{0.82}$ and ml/kg DM intake was higher with G1 (control) compared with both chamomile (G2) and thyme (G3). Using both chamomile and thyme in goat's rations reduced the water intake (ml /g DM intake) by 13.65 and 4.42 %, respectively compared with the control group. It could be also noticed that urine water (ml/head and ml/$kgw^{0.82}$) was remarkably deceased in G2 (507.7 and 25.67, respectively), while G3 showed slight decrease (612.3 and 31.67, respectively) than G1 (658.3 and 34.30, respectively). The same trend was observed also with fecal water. Thus, adding chamomile and thyme minimized total excreted water as ml/$kgw^{0.82}$ by 22.55 and 6.32% over G1 (control) but, without significance. Similar results were observed by Zeid (1998) with Zaraibi goats fed on some medicinal herbs and plants. In this respect, using medicinal additives in cow rations (chamomile and *Negilla sativa*) minimized drinking water /kg milk by 36.51 and 46.54%, respectively than the control (EL-Saadany et al., 2003). Generally, These results indicate that using medicinal herbs (such as chamomile flowers) in ruminant rations seems more suitable for desert conditions where water resources are somewhat restricted.

Table (3): Effect of experimental treatments on water intake and excretion by Zaraibi bucks.

Items	Treatments			SE
	G1	G2	G3	
Water intake:				
Drinking water:				
ml/h/d	1667	1493	1625	48.89
ml /$kgw^{0.82}$	86.80	75.53	84.17	2.43
Feeding water:				
ml/h/d	74.3	77.5	75.5	0.47
ml /$kgw^{0.82}$	3.76	3.93	3.91	0.03
Total water intake				
ml/h/d	1741	1571	1701	48.65
ml /$kgw^{0.82}$	90.70	79.47	88.05	2.41
ml/g DM intake	2.49	2.15	2.38	0.08
Excreted water:				
Urine:				
ml/h/d	658.3	507.7	612.3	34.22
ml /$kgw^{0.82}$	34.30	25.67	31.67	1.76
Fecal water				
ml/h/d	240.3	208.7	235.0	12.28
ml /$kgw^{0.82}$	12.53	10.60	12.17	0.68
Total excreted water				
ml/h/d	898.7	716.3	847.3	36.14
ml /$kgw^{0.82}$	46.83	36.27	43.87	1.92

2-Feeding trails

2-1- Milk yield

The averages of milk yield of lactating Zaraibi goats during suckling (early lactation) and lactation period are presented in Table (4). The obtained

results indicated that milk yield of Zaraibi goats during suckling period was significantly higher with G2 (199.54 kg /h or 2.218 kg /h/d) compared with the control (174.45 kg/h or 1.937 kg/h/d). Also, animals given thyme (G3) had higher milk yield during suckling period (193.0kg /h or 2.145 kg/h/d), without significance. During lactation period, the effect of both chamomile and thyme (228.18 and 222.75 kg/h) on total milk yield was significant. The daily milk yield during lactation period was improved by 10.93 and 8.22 vs. 14.51 and 10.74 in suckling period for G2 and G3, respectively compared with the control.

Table (4): Effect of experimental treatment on milk yield by lactating goats.

Item	Treatment			SE
	G1	G2	G3	
Suckling period (1-90 day):				
Total milk yield, kg	174.45b	199.54a	193.0ab	6.652
Daily milk yield, kg	1.937^{b}	2.218^{a}	2.145^{ab}	0.074
Lactation period(91-270 day):				
Total milk yield ,kg	205.50^{b}	228.18^{a}	222.75^{a}	5.855
Daily milk yield, kg	1.144^{b}	1.269^{a}	1.238^{ab}	0.032
Overall period(1-270day)				
Total milk yield, kg	379.95^{b}	427.72^{a}	415.75^{a}	6.013
Daily milk yield ,kg	1.407^{b}	1.586^{a}	1.540^{a}	0.039

a to b of the same row with different superscripts are significantly different (P≤0.05).

The positive (and significant) effect was observed also with both chamomile and thyme on total or daily milk yield during the experimental period (1-270 day) as shown in Table (4). The highest values (427.72 kg/h or 1.586 kg /h/d) were recorded with chamomile treatment followed by thyme treatment (415.75 kg/h or 1.540 kg/h/d) while, the lowest values were detected with the control group (379.95 kg/h or 1.407 kg /h/d). Thus, the overall mean of daily milk yield was improved by 12.72 and 9.45% for G2 (chamomile) and G3 (thyme), respectively compared with the control (G1). Similar results were observed by Allam et al. (1999), Kholif (2000) and El-Saadany et al (2003) using medicinal herbs and plants in dairy animal's rations.

On Zaraibi goats, Shehata et al. (2004) observed a positive effect of chamomile (10 g/100 kg BW) on overall mean daily milk yield (1.72 vs. 1.60 kg /h with or without chamomile) during the experimental period (270 day)..

2-2- Milk composition:

No noticeable effects of dietary supplements of chamomile and thyme were observed for milk contents during the two experimental periods (suckling and lactation) as shown in Table (5). However, the highest value of total solids percentage were recorded with G1 compared with both of chamomile (G2) and thyme (G3) and this may be attributed mostly to the lower milk production with G1 than G2 and G3 as shown in Table (4). Similarly, no clear effect of numerous medicinal herbs was observed for most milk composition (Zied, 1998; Kholif, 2000 and El-Saadany et al., 2003).

Table (5): Effect of experimental treatments on milk composition by lactating Zaraibi goats.

Item	Treatment			SE
	G1	G2	G3	
Suckling period (1-90 day):				
Fat, %	3.79	3.79	3.77	0.032
Protein, %	2.74	2.69	2.73	0.038
Lactose, %	4.62	4.60	4.62	0.030
Total solids, %	11.87	11.84	11.86	0.052
Solids non fat, %	8.08	8.05	8.09	0.056
Ash , %	0.73	0.73	0.73	0.007
Lactation period(91-270 day):				
Fat, %	4.77	4.72	4.71	0.048
Protein, %	2.99	2.98	2.97	0.029
Lactose, %	4.63	4.61	4.60	0.023
Total solids, %	13.12	13.05	13.01	0.066
Solids non fat, %	8.36	8.34	8.30	0.043
Ash , %	0.74	0.75	0.74	0.009
Overall period(1-270day)				
Fat, %	4.40	4.41	4.40	0.043
Protein, %	2.91	2.88	2.89	0.032
Lactose, %	4.63	4.61	4.61	0.025
Total solids, %	12.70	12.65	12.63	0.061
Solids non fat, %	8.27	8.24	8.23	0.047
Ash , %	0.74	0.74	0.74	0.008

2-3-Feed conversion and economical efficiency:

Concerning daily feed intake, goats consumed approximately similar quantity of DM intake (ranged from 1663.6 to 1670.1 g/head or 109.1 to 110.8 g/kgw$^{0.75}$) as shown in Table (6).

Table (6): Average daily feed intake* and feed conversion and economical efficiency of lactating Zaraibi goats as affected by the experimental treatments.

Item	Treatments		
	T1	T2	T3
Daily DM intake (g/h)			
From CFM	989.9	994.1	993.8
From BH	402.3	403.5	402.8
From RS	271.4	272.5	271.9
Total DM intake (g/h)	1663.6	1670.1	1668.5
DM intake(g/kgw$^{0.75}$)	110.8	109.1	109.6
TDN intake (g/h)	964.2	1040.3	1021.1
TDN intake(g/kgw$^{0.75}$)	64.28	67.95	67.05
DCP intake (g/h)	122.9	134.8	131.1
DCP intake(g/kgw$^{0.75}$)	8.19	8.80	8.61
Daily milk yield (g/h)	1407	1586	1540
Feed conversion:			
Kg DM /kg milk	1.182	1.053	1.083
Kg TDN /kg milk	0.685	.656	0.663
Kg DCP / kg milk	0.087	0.085	0.085
Economic efficiency:			
Feed cost, L. E. /h	0.990	0.997	0.995
Price of milk, L.E./h	1.759	1.983	1.925
Feed cost/kg milk, L.E.	0.563	0.503	0.517
Efficiency	1.78	1.99	1.93

* Group feeding

** The prevailing prices, per ton, at time of the study were, 600 L.E-CFM, 450 L.E.- berseem hay, 80 L.E.- Rice strew, chamomile, 11000 L.E- thyme, 9000 L.E and 1250 L.E.- milk

But, TDN intake was higher with G2 (1040.3 g/h or 67.95 g/kgw$^{0.75}$) and G3 (1021.1 g/h or 67.05 g/kgw$^{0.75}$) compared with the control group, G1 (964.2 g/h or 64.28 g/kgw$^{0.75}$). Similarly, DCP intakes recorded the highest value with chamomile treatment, G2 (134.8 g/h or 8.80 g/kgw$^{0.75}$) followed by thyme treatment, G3 (131.1 g/h or 8.61 g/kgw$^{0.75}$) while, the lowest values was detected with G1 (122.9 g/h or 8.19 g/kgw$^{0.75}$) and this may be attributed to the improvement of digestion coefficients of all nutrients and nutritive value (TDN and DCP%) with both chamomile and thyme as shown in Table (2).

In the same line, the feed conversion efficiency based on DM, TDN or DCP, was better with the presence of medicinal herbs (G2 and G3) compared with the control group (G1). The feed conversion efficiency (based on DM was improved by 10.91 and 8.38% with both chamomile and thyme (G2 and G3, respectively) compared with G1. A similar trend was noticed when efficiency of conversion was based on TDN where the best was G2 (0.656) followed by G3 (0.663) and lastly the control group (0.685). The obtained values of feed conversion are within the normal range given by Abdelhamid et al. (1999). In this respect, Allam at al. (1999) found that using chamomile flowers as feed additive to lactating does could improve feed conversion as TDN/ kg milk by 26.85% compared with the control (without addition).

The feed cost per kg milk were L.E.- 0.563, 0.503 and 0.517 for G1, G2 and G3, respectively as shown in Table (6). Thus, the economic efficiency was improved with both chamomile (G2) and thyme (G3) by 11.80 and 8.43% compared with G1 (control). These results are in agreement with those obtained by El- Saadany *et al.* (2003) using some medicinal herbs (chamomile flowers and *Negilla sativa*) in dairy cow's rations. Generally, although chamomile treatment showed the highest feed cost/h./d, yet, it also showed the highest economic return compared with other treatments(Zeid, 1998).

2-4 -Changes in live body weight (LBW):

Body weights of goats during the last month of pregnancy, suckling and lactation are shown in Figure (1). The initial LBW's (at the 5th month of pregnancy) were approximately equal in the three groups (ranged from 54.8 to 55.3 kg). The LBW of does increased to the maximum before parturition (end of pregnancy) and recorded the highest values (ranged from 57.2 to 58.7 kg) then sharply decreased (post- parturition) to the minimum at 60 days (in G1 alone) and 90 day (in G2 and G3) of lactation. Thereafter, it tended to increase again (but very slowly) within all groups during the lactation period. The same trend was observed by Ahmed et al. (2001 and 2003). Devendra (1979) recorded a decline in body weight of high milk yielding goats during the first month post- parturition. Moreover, Ahmed (1999) observed that Zaraibi goats fed 100% NRC had decreased LBW from 13 to 22 % at 60 days post-parturition. In the present study, the decrease in LBW of does attained during the 2nd month (at 60 days) were 23.4, 21.80 and 22.10 % of body weight for G1, G2 and G3, respectively. In this respect, the LBW of desert Barki does decreased during early lactation and reach a minimum value at the 4th week then tended to increase with advancing of lactation (Haider,

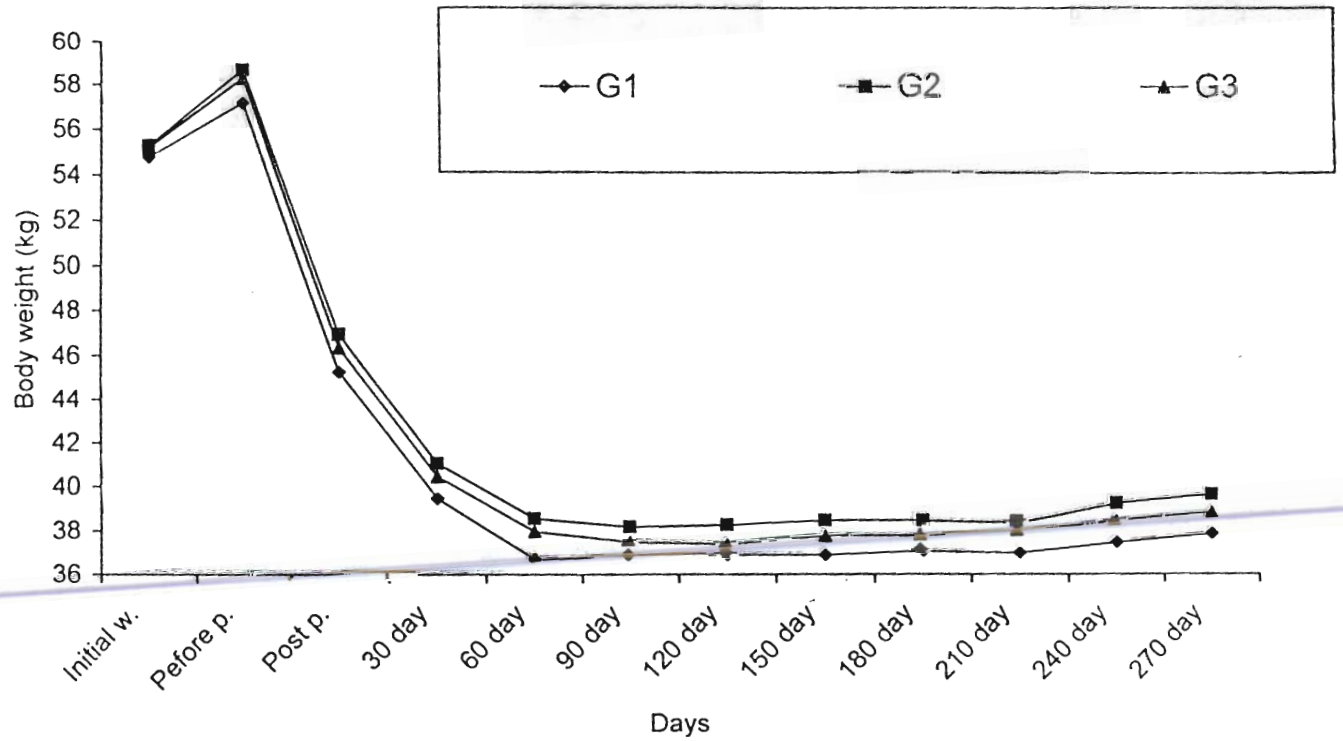

Fig .(1) : Body weight changes of Zaraibi goats during the late pregnancy and lactation periods as influenced by the different treatments

1994). Concerning the effect of treatment, the obtained results indicated that LBW tended to increase by medicinal herbs, especially with G2 (chamomile) during most of experimental months. The averages of LBW before parturition were 57.2, 58.7 and 58.3 kg and the corresponding values at the weaning (90^{th} day) were 36.8, 38.2 and 37.5 kg, whereas at the 270^{th} day (9 month) were 37.9, 39.7 and 38.9 kg for G1, G2 and G3, respectively. Similar results were observed by Allam et al. (1999).

2-5- Rumen liquor parameters:

Rumen parameters are presented in Table (7). The differences among the 3 treatments were not significant in pH value before feeding (0 time) and at 2,4 and 6hr post feeding. The maximum pH values were recorded at 0 hr and gradually decreased to the minimum at 4 hr post feeding and tended to increase again thereafter at 6 hr. Similar trend have been reported by Ahmed et al. (2000). Ruminal NH_3-N concentration (Table 7) tended to increase with G1 especially at 2 and 4 hr (26.60 and 25.65 mg/100 ml, respectively) compared with G2(24.97 and 23.95 mg/100 ml, respectively) and G3 (25.81 and 24.87mg/100ml ,respectively). These observations are in harmony with the findings of Zied (1998) at most hours (0,2 and 6 her). Ruminal TVFA's concentrations were less in the rumen of Zaraibi goats fed the control diet(G1) compared with the other diets (G2 and G3) as shown in Table (7). Rumen TVFA's concentrations post feeding (2,4 and 6 her) were the highest values with chamomile treatment (G2) then followed by thyme treatment (G3) and lastly, the lowest values were detected with the control group(G1) and the differences were significant at 2 and 4 hrs alone. In this respect, raminal TVFA's concentrations at 6 hr post feeding were improved by 31.83% with chamomile treatment (11.39 m Eq/100ml) compared with the control diet (8.64 m Eq/100 ml) (Allam et al., 1999) In the present study, the highest values of TVFA's concentration was at 4 hrs post-feeding which was reflected on lowering pH values at that time. Similar results were given by Ahmed et al. (2001) and Gabr et al. (2003).

Table (7): Rumen liquor parameters of goats fed the experimental diets.

Item	Hours	Treatments			SE
		G1	G2	G3	
pH value	0	7.0	6.87	6.88	0.09
	2	6.60	6.63	6.63	0.10
	4	6.30	6.40	6.43	0.08
	6	6.70	6.73	6.63	0.06
Ammonia-N (mg/100ml)	0	16.27	16.13	16.13	0.90
	2	26.60	24.97	25.81	0.71
	4	25.65	23.95	24.87	0.78
	6	22.81	22.27	22.32	0.76
TVFA's (m Eq/100ml)	0	7.70	7.97	8.17	0.48
	2	9.40	10.73	10.17	0.44
	4	9.97^{c}	11.77^{a}	10.93^{b}	0.16
	6	9.30^{b}	11.07^{a}	10.53^{a}	0.29

a to c of the same row with different superscripts are significantly different (P≤0.05).

2-6-Blood parameters:

Effect of the tested rations on some blood components are present in Table (8). The results indicated that most tested blood parameters were not significant affected by the tested medicinal herbs. However, the lowest values of glucose and triglycerides (69.33 and 81.33) were recorded with G1 compared with both treatments (G2 and G3), but without significant differences. Meanwhile, cholesterol and total lipids were lower with both chamomile and thyme than the control group (G1) and the differences were significant with total lipids alone. Similar trend was observed with Shehata et al. (2004) with goats fed different levels of chamomile (0,5 and 10 g/100kg BW). Moreover, serum protein was significantly higher with chamomile treatment compared with G1 (7.13 vs. 6.53 g/dl) whereas, G3 recorded medium value (6.93 g/dl) as shown in Table (8). Serum urea and creatinine concentrations showed some fluctuations among groups. In this respect, serum protein, triglycerides and globulin were increased while total lipids and cholesterol were reduced in Zaraibi goats as a result of chamomile flowers inclusion to the diet (El-Hosseiny et al., 2000).

Generally, the obtained results indicated that blood components measured were showed slightly differences among treatments tested, yet all values were within the normal ranges as reported by Kaneko (1989).

Table (8): Blood parameters of lactating Zaraibi goats as affected by the experimental treatments.

Item	Treatments			SE
	G1	G2	G3	
Glucose, mg/dl	69.33	75.00	71.00	2.55
Triglycerides, mg/dl	81.33	88.33	90.0	2.66
Total lipids, mg/dl	384.67^{a}	302.33^{b}	316.0^{b}	13.71
Cholesterol, mg/dl	103.33	95.0	89.67	6.15
Total protein, g/dl	6.53^{b}	7.13^{a}	6.93^{ab}	0.16
Urea, mg/dl	39.67	40.67	38.67	2.58
Creatinine, mg/dl	1.33	1.17	1.27	0.09

a to b of the same row with different superscripts are significantly different (P≤0.05).

CONCLUSION

It could be concluded that both chamomile and thyme had a positive affect on improving milk yield by lactating Zaraibi goats and the improvement was higher with the chamomile treatments (reached to 12.72% in G2 vs. 9.45% in G3). Moreover, feed utilization and economical efficiency were better with medicinal herbs groups, especially G2. However, no adverse effects of both chamomile and thyme were observed on milk composition and metabolic promoters.

REFERENCES

Abdelhamid. A.M; E.I. Shehata and M.E Ahmed (1999). Physio-nutritional studies on pregnant and lactating goats fed on rations differing in roughage /concentrate ratio at different feeding levels and/or not supplemented with bentonite 3-Effects on productivity, reproductivity and digestive and metabolic disturbances. J. Agric. Sci., Mansoura Univ., 24 : 4637.

Aboul- Fotouh, G. E.; S.M. Allam; E.I. Shehata and. S.N AbdEL-Azeem (1999). Effect of some medicinal plants as feed additives on performance of growing sheep. Egyptian J. Nutrition and Feeds, 2:79.

Abou-Zeid, E.M.(1986). Medical Plants and Herbs.(Textbook, in Arabic)Seas house, Beirut.

Ahmed, M.E. (1999). Improving feed conversion efficiency during reproduction-stress-phases . Ph.D. Thesis Fac. Agric., Mansoura Univ.

Ahmed, M. E.; A.M. Abdelhamid, F.F. Abou Amou, E.S. Soliman, N.M. El-Kholy and E.I.Shehata (2001). Response of milk production of Zaraibi goats to feeding silage containing different levels of Teosinte and Kochia. Egyptian .J. Nutrition and feeds, 4 (Special Issue):141.

Ahmed, M.E.; E.I. Sheheta and A.M. Abdelhamed (2000). Growth performance of male kids according to different feeding levels, concentrate to roughage ratio and diet inclusion of bentonite. Proc. 3rd all Africa Conf. Anim. Agric. &11th Conf. Egyptian soc. Anim. Prod., Alexandria, Egypt, 6-9 November ,201.

Ahmed, M.E.; E. I. Shehata; F. F. Abou Ammou; A. I. Haider; S. A. Tawfik and M.H Houssein (2003). Effect of some suckling systems on performance of does and born kids of Zaraibi goats. Egyptian J. Nutrition and Feeds, 6 (Special Issue):1235

Allam, S.M.; H.M. El-Hossieny; A.M. Abdel-Gawad; S.A. El-Saadany and A.M.M. Zeid (1999). Medicinal herbs and plants as feed additives for ruminants. 1-Effect of using some medicinal herbs and plants as feeds additives on Zaraibi goat performance. Egyptian J. Nutrition and Feeds, 2 (Special Issue):349.

Ayyad, K.M. (2003). Studies on some dairy products. Ph. D. Thesis Fac. Agric., Mansoura Univ.

A.O.A.C.(1995). Official Methods of Analysis (16th) Edt. Association of Official Analytical Chemists, Washington, D.C., USA.

Chevallier, A. (1996). The Encyclopedia of Medicinal Plants (Textbook, In English). DK Publishing, INC. New York 10016, USA.

Conway, E.F.(1957). Microdiffusion Analysis and Volumetric Error. Rev. Ed. Lock Wood, London

Devendra, C.(1979).Goat production in Asian region, current status available, genetic resources and potential prospects. Indian Dairy Man., xxx :513.

Duncan, D. (1955). Multiple range and multiple F-test. Biometrics, 11:1.

El- Hosseiny, H. M.; S.M. Allam, S. A. El -Saadany, A. M. Abdel-Gawad and A.M. M. Zeid (2000). Medicinal herbs and plants as feed additives for ruminants. 2-Effect of using some medicinal herbs on growth performance of Zaraibi kids. Proc. Conf. Anim. Prod. Sakha, Kafr El-Sheikh, Egypt. 18-20 April,189.

El- Saadany , S.A.; A.M.M. Zeid, A.M. A. Mohi- Eldin and T. I. El- Monayer (2003). Impact of using different feed additives on the performance of lactating Friesian cows. Egyptian J. Nutrition and feeds ,6 (Special Issue): 551

El-Saadany, S. A.; M. Abdel-Momin; F. Abo-Ammou and E.Shehata (1996). Effect of using medicinal herbs as milk stimulant feed supplementation on ewes and lambs performance. Egyptian J. Appl. Sci., 11:41.

Frits, Z.A.; S. Schleicher; L. Kinal; Jarosz and F. Majdanski (1992). Substitution of antibiotics by herbs in feed mixtures for broiler chicks. Rocznik Naukowe Zootechniki Monografie Rozprawy, 31:315.

Haider, A.I. (1994). The yield and composition of milk and pre-weaning growth rate of Barki desert goats in Egypt. Alex..J. Agric. Res., 39 :155.

Gabr, A. A., E.I. Shehata, M.E. Ahmed and M.H. Azzam (2003). Performance and carcass traits of Rahmani lambs fed rations containing dried poultry manure with addition of bentonite clay. Egyptian. J. Nutrition and Feeds, 6:173.

Kaneko, J.J (1989). Clinical Biochemistry of Animals. 4th Ed. Academic Press, Inc. USA.

Khanna, T., F.A. Zaidi and P.C. Dandiya (1993). Central nervous system and analgesic studies on *Nigella staiva*., Fitoterapia, 64 (5):407.

Kholif, A. M. (2000). Medicinal plants seeds supplementation to lactating goats diets and their effects on milk yield and milk composition. Proc. 3rd All Africa Conf. Anim. Agric. & 11th Conf. Egyptian Soc. Anim-Prod., Alexandria, Egypt, 6-9 November, P:197

Korshom, M.;A. Abdel Mogney and A. Mandour (1998). Biochemical and parasitological evaluation of *Nigella sative* against rumen fluke (paramphistomum) in sheep as compared with trematocide Hapodex. Assiute Vet. Med. J., 39 (78)

Ling, E.R. (1963).A Text Book of Dairy Chemistry. Vol.11, Chapman & Hall, Ltd. , London.

McIntyre, A.(1995). The complete Woman's Herbal, Henry Holt Co., New York, Pg.41.

Mericli, .A.H.(1990). The lipophilic compounds of Turkish *Matricaria chamomilla* verity with no chamazulene in the volatile oil. International J. Rlude Drug Res., 28 (2):154.

Mohamed , A. H. , B.E. El-Saidy and I. A. El-Seidi (2003). Influence of some medicinal plants supplementation.: 1- On digestibility, nutritive value, rumen fermentation and some blood biochemical parameters in sheep. Egyptian J. Nutrition and Feeds, 6:139.

NRC. (1981). Nutrient requirements of domestic animals. Nutrient requirements of goats. National Research Council, Washington, D.C. USA.

SAS Institue (1994). SAS./STATR User's Guide: Statistics. Ver. 6.04, Fourth Edition SAS Institute Inc, Cary, NC.

Singh, N.; M.A. Akbar and R. Kumari (1993). Effect of some commonly used galactagogues on different blood biochemical constituents of lactating buffaloes. Indian Vet. J., 70:441.

Shehata, E.I, M.E. Ahmed, Ferial. H. Abd El-Rasoul, Faten F. Abou Ammou and R. El- Ahwal (2004). Effect of feeding a medicinal herb, chamomile flower, on production and hygiene of goat milk production. J. Dairy Sci. (In press).

Warner, A.C.I.(1964).Production of volatile fatty acids in the rumen Methods of measurements. Nutr. Abst.Rev.,34:339.

Wideneki, K; R. Stenzel; L. Saba and B. Wencel (1998). Preliminary results rearing calves fed with mineral- herb mash for 3 months. Annales Universition Mariae Curie Saklodowska Sectio, EE Zootectechnica, 16:107.

Youssef, M .M.; Abdiene, A M.; Kattab R. M. and S.M. Darwish (1998). Effect of feeding *Nigella Sative* on productive and reproductive performance of buffaloes. Egyptian J. Nutrition and Feeds, 1: 73.

Zeid, A.M. (1998). Effect of using medicinal plants on goats performance., Ph. D. Thesis, Fac. of Agric., Cairo Univ., Egypt.

الأداء الإنتاجى للماعز الزرايبى المغذاة على علائق محتوية على بعض الأعشـــاب الطبية

عبد المنعم محمد مصطفى زيد و محمد إبراهيم أحمد

معهد بحوث الإنتاج الحيوانى – مركز البحوث الزراعية – دقى-جيزة-مصر

أجريت هذه الدراسة بهدف دراسة تأثير بعض الأعشاب الطبية مثل الكاموميل والزعتر علـى إنتاج اللبن والتحويل الغذائى والكفاءة الاقتصادية وبعض قياسات سائل الكرش والدم ،حيث تم استخدام عـدد ٣٠ عنزة زرايبى فى مرحلة الحمل المتأخر (فى نهاية الشهر الرابع من الحمل) عمر ٣-٦ سنوات بمتوسط وزن ٥٥كجم ، وقد قسمت إلى ثلاث مجموعات متساوية فى العدد(١٠ فى كل مجموعة) ، وقـد تـم تغذيـة الحيوانات طبقا لمقررات NRC لعام ١٩٨١ على العلف المصنع ودريس البرسيم وقش الأرز فى مجموعـة المقارنة (مج١)بينما فى المجموعتين ٣،٢ غذيت الماعز على عليقة المقارنة + ٦٠ملجرام /كجم وزن حـى يوميا من الكاموميل (مج٢) والزعتر(مج٣) ، وتم تقييم القيمة الغذائية للعلائق السابقة بـإجراء عـدد ثلاثـة تجارب هضم على ذكور الماعز الزرايبى التامة النمو.

وأوضحت النتائج أن كل من الكاموميل والزعتر أدى إلى زيادة معنوية فى هضم معظم العنـاصر الغذائية والقيمة الغذائية(المركبات المهضومة الكلية والبروتين المهضوم).أيضا تحسن محصول اللبن اليومـى وسجل أعلى قيمة (١,٥٨٦كجم) مع مجموعة الكاموميل (مج٢) ومجموعة الزعـتر مـج٣(١,٥٤٠كجـم) مقارنة بمجموعة الكنترول (مج١)والتى سجلت أقل قيمة (١,٤٠٧كجم) ، وكانت الاختلافات معنوية،ولكن لـم يحدث تغير جوهرى فى مكونات اللبن (الدهن- البروتين- اللاكتوز- المواد الصلبة)بين المجموعـات. أدى استخدام كل من الكاموميل والزعتر إلى تحسن ايجابى فى معدل التحويل الغذائى خلال فـترة إنتـاج اللبـن (٢٧٠ يوم) ، فى حين سجلت الكفاءة الاقتصادية تحسنا بمعدل ١١,٨٠ ،٨,٤٣ % للمجموعة الثانية والثالثـة على التوالى مقارنة بالكنترول.

وقد أظهرت النتائج أيضا أن كل من الكاموميل والزعتر لم يؤثر معنويا علـى رقـم الحموضـة وأمونيا سائل الكرش، فى حين لوحظ تحسن معنويا فى الأحماض الدهنية الطيارة عند السـاعتين ٦،٤ بعـد الأكل مع الأعشاب الطبية خاصة الكاموميل ، أما بالنسبة لقياسات الدم فقد لوحظ انخفاض فى الدهون الكليـة والكولسترول وزيادة فى البروتين والجلسريدات الثلاثية نتيجة لوجود كل من الكاموميل والزعتر فى علائـق الماعز .

من هذه الدراسة يتضح أن استخدام كل من الكاموميل والزعتر فى علائق الماعز الزرايبى أثنـاء الفترة الأخيرة من الحمل وفترة الحليب له تأثير إيجابى على إنتاج اللبن و معدل التحويل الغذائـى والكفـاءة الاقتصادية بدون تأثير سلبى على ميتابوليزم الحيوان.