

EFFECT OF FEEDING THE MEDICINAL HERB, CHAMOMILE FLOWER, ON SOME PRODUCTIVE PERFORMANCE OF EGYPTIAN ZARAIBI DOES AND THEIR NEW BORN KIDS

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ABSTRACT

This research was conducted to evaluate effects of the dietary supplement with chamomile flowers on the productive performance of Egyptian Zaraibi does and their newly born kids. Ninety pregnant does were divided into three equal groups (G1, G2 and G3) and fed according to NRC (1981) allowances where diets contained 0, 5 and 10g chamomile/100 kg BW/day, respectively. The results showed minor differences in body weight of does during late pregnancy until weaning kids.

Alive kids per doe, especially at weaning, increased significantly due to chamomile supplement. The mortality rate of born kids was estimated as 13.5% in G2 and 10.4% in G3 vs. 19.3% in the control group. Kids weights increased with chamomile especially male kids. Accordingly, output measured as kilograms produced per doe per year improved significantly due to chamomile supplement.

The digestive disturbances symptoms on born kids (diarrhea and bloat) were clearly reduced in G2 and G3 groups than in G1.

Keywords: *Zaraibi goats, chamomile flower, performancem, born kids, mortality rate.*

INTRODUCTION

Medicinal plants are common used for human health and recently for animals as chamomile, thyme and fennel (Shehata et al, 2004; El-Bordeny et al., 2005; El-Ashry et al., 2006 and Hamodi, 2007)

One of the most common medicinal plants used in many countries is chamomile flowers because of its favorable effect on relaxation and reducing fever and cold as well as relive of stomach pain (Jakolev and Isaac, 1979). Chamomile flowers contain many chemical compounds such as coumarins, flavonoids (more than 8%), aromatic oils (more than 50%) which include Alpha bisabolol, azulene and chamazulene (Blumenthal, 2000, Schulz et al., 1998 and Orav et al., 2001). The most important components in chamomile flowers are alpha-bisabolol (8-14%) and chamazulene (5-7%). Recent studies showed the favourable effects of alpha-bisabolol as an antibacterial, antifungal as well as fever reducing agents, that have a favourable effect on skin burns of laboratory animals (Escop, 1990 and Korting et al., 1993). Chamazulene has an antialergitic, inflamenatory and stomach pain (Mann and Staba, 1986 and Der-Marderosiam and Liberti 1988). Since the chamomile flowers contains heteropoly saccharides, so it has an effect on

stimulating the macrocytes cell, and it activates the immunoregulation and increase the sensitivity of the effectors cells (Uteshev, 1999).

In small ruminant, (Zied 1998, Abdelhamed *et al.*, 2004 and Shehata *et al.*, 2004) found that using some medicinal herbs in small ruminant diets had a positive effect on productive performance as well as some metabolic parameters. Moreover, serum cholesterol and total lipids were reduced while triglycerids, protein and globulin in goats were increased as a result of adding chamomile flowers to the diet (El-Hosseiny *et al.*, 2000). The same authors found that using chamomile in does diets (60mg /kg BW) reduced mortality rate of born kids to zero during the suckling period compared with rates of 6.7 to 13.3% for other medicinal herbs. This suggests that chamomile may have a role in improving immunity and performance of born kids.

As Egyptian Nubian goats (Zaraibi) proved potential for high milk yield and litter size while still lack genetic homogeneity as wide variation recorded among individuals. Therefore, the present study was conducted to verify and manipulate possible improvement could gained by addition of chamomile flowers on the performance of does and their born kids.

MATERIALS AND METHODS

The present study was conducted at El- Serw Experimental Research Station, Animal Production Research Institute belonging to Agricultural Research Center, Ministry of Agriculture, Egypt.

Ninety Zaraibi does at the last month of pregnancy, of 57.35 kg average live body weight, received three feeding treatments (each for 30 does). Animals were weighed at the beginning of the experiment and biweekly. Does received diets in groups. Zaraibi does in groups G1, G2, and G3 received a daily feed supplement of 0, 5 and 10 g chamomile/100 kg Bw, respectively. Chamomile flowers were mixed with approximately 10 g of ground concentrate and spread daily as powder over the concentrate feed mixture, as reported by Chiquette *et al.* (1993) and Ahmed *et al.* (2001).

Amounts of concentrate and roughage fed were based on Feed Allowance of NRC (1981). The feed mixture (CFM) and roughage (berseem hay and bean straw) were offered at 50:50 ratio. The concentrate feed mixture (CFM) was consisted of 26% undecorticated cottonseed meal, 38% yellow corn, 20% wheat bran, 7% rice bran, 5% molasses, 2.5% limestone, 1% common salt and 0.5% mineral mixture. Samples of feeds were analyzed according to A.O.A.C. procedures (1988). The chemical composition of feed stuffs (concentrate feed mixture, berseem hay and bean straw) consumed by Zaraibi does are shown in Table 1. Water was available all times. Diets were offered twice daily at 8.00 am and 3.00 pm. Kids were weighed at birth (12 hours post-kidding) then, every 15 days. Born kids were kept with their dams for free suckling till 3 months old. Litter size (foetus / doe), kidding rate (litter size x 100), fecundity (alive kids/ doe) and economical efficiency were calculated. Mortality and digestive disturbances especially diarrhea and bloat were recorded.

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Table 1. Chemical composition of feed stuffs consumed by Zaraibi does.

Feed	DM	Chemical composition					
		OM	CF	CP	EE	NFE	Ash
Concentrate feed mixture	90.7	91.3	16.1	15.0	3.2	57.0	8.7
Berseem hay	88.7	87.0	29.9	11.1	2.4	43.6	13.0
Bean straw	89.5	86.1	37.9	5.5	1.2	41.5	13.9

Data were statistically analyzed by the least squares Method described by the Likelihood program of SAS (1994). Differences among means were determined by Duncan's New Multiple Range Test (Duncan, 1955).

RESULTS AND DISCUSSION

The body weights of Zaraibi does (Table 2) indicated non significant BW differences among the studied groups.

Table 2. Live body weight of Zaraibi does fed chamomile supplemented rations

Days	Groups		
	G1	G2	G3
Initial weight (at 120 day of pregnancy)	57.15±0.85	58.01±0.73	56.89±0.90
Weight at kidding	46.62±1.13	45.41±0.93	44.83±1.25
Weight at 90 d post kidding	42.51±1.13	41.85±0.93	41.69±0.87
Weight at 90 days as % of weight at kidding	91.18	92.16	93.00

Productive performance of Zaraibi does

Results in Table 3 show a trend of better litter size in favor to chamomile addition but not statistically significant. Yet, one abortion case was happened in G1 and G2. Does given chamomile flowers (G2 and G3) were lower in still birth cases than those fed control ration (G1). The percentage of still birth cases were 23 and 20% in the two chamomile treated G2 and G3, respectively versus 30% in control group (G1).

From data in Table 3, it seems that incidence of twins parturition was high in Zaraibi does, hence, the kidding rate or litter size was high too. Litter size was ranged from 2.31 to 2.47 without marked differences among treatments. Moreover, kidding rate was 243 and 247 in chamomile groups (G2 and G3, respectively) versus 231 in control group. Similar values for litter size of Zaraibi does were obtained by Mousa (1996) while Abdel hamid *et al.*, (1999) found it ranged from 2.25 to 2.42 when fed clays.

Number of alive kids/doe at birth were more in chamomile treated groups (2.11 for G2 & 2.23 for G3) compared with 1.97 for G1. With advance of kids age up to weaning, impact of chamomile on viability of kids was more pronounced as alive kids/doe were 1.82 in G2 and 2.00 in G3 vs. 1.59 only in control group (G1).

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Table 3. Effect of chamomile supplement on the productive and reproductive performance of Zaraibi does.

Item	Groups		
	G1	G2	G3
No of does	30	30	30
Abortion cases	1	1	-
Mortality cases	-	1	-
Still birth cases	9	7	6
Postpartum Mortality cases	2	-	-
Total mortality of does	2	1	-
Born kids	67	68	74
Still birth kids No.	10	9	7
Alive kids at 0 days	57	59	67
Alive kids at 90 days	46	51	60
Litter size	2.31	2.43	2.47
Kidding rate%	231	243	247
Fecundity at birth	1.97	2.11	2.23
Fecundity at weaning	1.59	1.82	2.00
Average birth weight, kg	1.65±0.02	1.67±0.03	1.69±0.02
Average weaning weight, kg	11.28±0.15	11.69±0.18	11.86±0.16
kilogram born / doe	3.21±0.35	3.29±0.29	3.77±0.22
kilogram weaned per doe	17.72 ^b ±1.99	19.87 ^{ab} ±1.95	23.73 ^a ±1.51
Economic Efficiency(EE),%	1.8	2.11	2.33
Rate of EE improvement,%	-	17.2	29.4

a to b of the same raw with different superscripts are significantly different.

Kids performance

Feeding chamomile flower in does' ration had positive effect on kids weight (Table 4).

The most recognized effect was on male kids at weaning since they may benefit possible more milk produced by does. DBG of male kids were 115 and 119 g/d for G2 and G3 compared with 109 g/d for G1. That was reflected on TBG, being 10.35 and 10.68 kg/kid for G2 and G3 compared with 9.88 kg/kid for G1. Females showed light changes. Thus it seems that chamomile play more role in viability and livability of kids rather than their growth rate. In this respect, using chamomile flowers decreased somatic cell counts (SCC) significantly in milk of Zaraibi goats (Shehata *et al.*, 2004). On the other hand, El-Hosseiny *et al.*, (2000) found significant impact for chamomile when supplemented to diets of suckling dams and growing kids, where growth rates were 83.82 and 72.57 g/d during suckling and growing periods vs. 66.23 and 48.94 g/d with the control group.

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Table 4. Effect of chamomile supplement on growth performance of Zaraibi kids.

Items	Sex	Groups			Average
		G1	G2	G3	
Birth weight, kg	Male	1.74±0.02	1.76±0.03	1.77±0.02	1.76 ^A ±0.01
	Female	1.56±0.02	1.51±0.03	1.60±0.02	1.56 ^B ±0.01
Weaning weight, kg	Male	11.63±0.20	12.11±0.20	12.46±0.19	12.10 ^A ±0.12
	Female	10.82±0.17	10.58±0.19	11.03±0.18	10.85 ^B ±0.01
Daily body weight gain, g	Male	109±0.002	115±0.002	119±0.002	115 ^A ±0.001
	Female	102±0.002	100±0.002	105±0.002	103 ^B ±0.001
Total body weight gain, kg	Male	9.88±0.19	10.35±0.18	10.68±0.18	10.34 ^A ±0.11
	Female	9.21±0.15	9.02±0.19	9.43±0.18	9.26 ^B ±0.10

A to B of the same column with different superscripts are significantly different

Digestive disturbances and mortality rate:

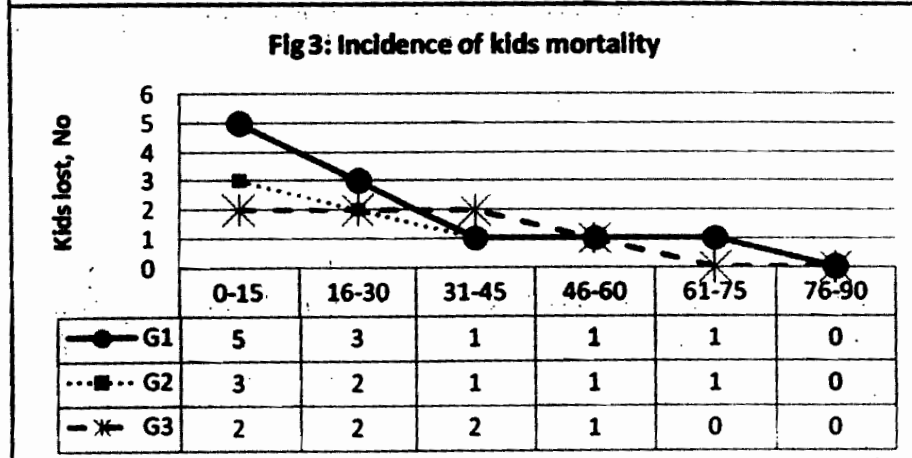
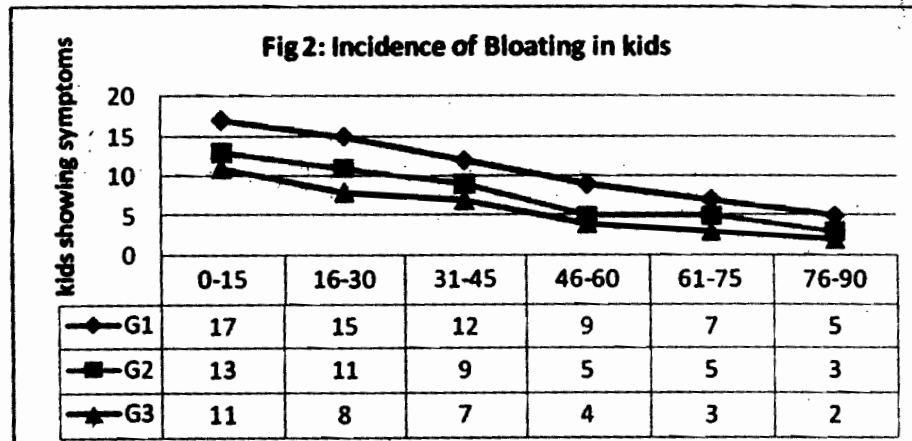
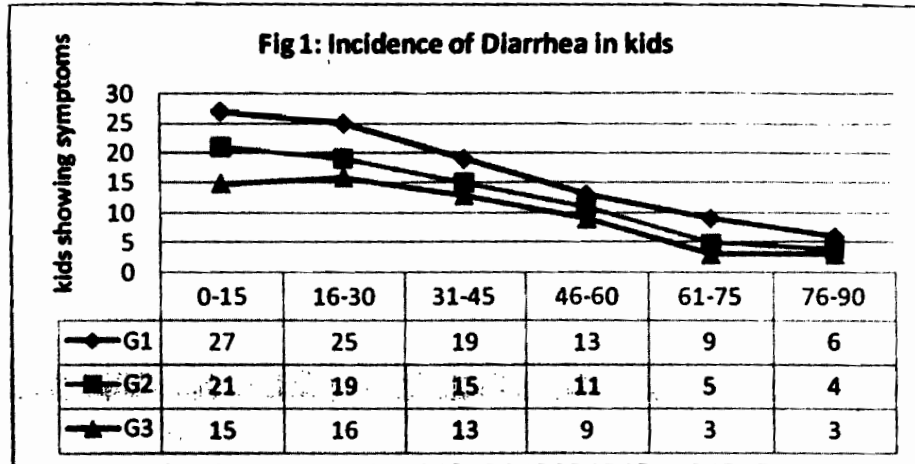
Incidence of diarrhea and bloat in born kids (Figures 1 & 2) during suckling period were noticeably reduced with chamomile supplement and more decreased with increasing chamomile concentration.

This noticeable effect on reducing digestive disturbances (diarrhea and bloat) and consequently reducing mortality rate of born kids (Figure 3) might be attributed to active ingredients like flavonoids, coumarins, aromatic oils (alpha bisabolol, azulene and chamazulene) in chamomile flowers that function as better tonic, antiseptic, stomach pain release, anti-inflammatory and antispasmodic agent (Mann and Staba, 1986, Korting *et al.*, 1993, Ody Penelope, 1993 and McIntyre, 1995).

CONCLUSION

It could be concluded that using chamomile flower (at rate 5-10 g/h/d) has positive effect on offspring vitality and livability. It also reduces digestive disturbances. Cost of this supplement is compensated by the improvement of animals performance, yet it is feasible.

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تأثير زهرة البابونج على الحالة الإنتاجية لأمهات الماعز الزرايبي وجدانها المولودة

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هذا العمل البحثي هدف إلى دراسة تأثير زهرة البابونج على الأداء الإنتاجي لأمهات الماعز الزرايبي وجدانها المولودة. تم استخدام ٩٠ عذرة زرايبي أثناء الشهر الأخير من الحمل، قُسمت إلى ثلاث مجموعات (مج ١، مج ٢، مج ٣) متساوية وغذيت تبعا لمقرارات NRC(1981) مع إضافة صفر، ٥، ١٠ جم من زهرة البابونج لكل ١٠٠ كجم وزن حي للمجموعات الثلاث بالتوالي.

وقد أظهرت النتائج أن وزن العنزات أو الجداء لم يتأثر معنويا بإضافة البابونج. ولكن حالات الولادات النافقة انخفضت بدرجة معنوية مع استخدام البابونج، حيث لوحظ زيادة عدد الجداء الحية لكل أم وخاصة عند القطام للمجموعات المضاف البابونج لغذائها. كما كان هناك تأثير إيجابي للبابونج على معدل النمو اليومي للجداء وخاصة الذكور. بناء على ذلك حدث تحسن واضح في عدد الكيلوجرامات المقطومة لكل أم في حدود ١٢,٠ % للمجموعة ٢ و ٣٤,٠ % في المجموعة ٣ مقارنة بالكنترول.

أما بالنسبة للحالة الصحية للجداء فقد أظهرت النتائج انخفاضا ملحوظا في ظاهرة الإسهال والنفاخ نتيجة لإضافة البابونج، مما انعكس على انخفاض معدلات النفوق في الجداء إلى ١٣,٥ % في مج ٢ و ١٠,٤ % في مج ٣ بينما وصلت إلى ١٩,٣ % في مجموعة الكنترول.

من هذه الدراسة نلاحظ أن استخدام زهرة البابونج أثناء الفترة الأخيرة من الحمل وأثناء فترة الرضاعة (٩٠ يوما) يحقق منفعة اقتصادية نتيجة أثره الإيجابي على حيوية الأمهات والنتاج.