

## **IMPROVING PERFORMANCE OF LOCAL GOATS IN THE NORTH WESTERN COASTAL DESERT OF EGYPT THROUGH CROSSING WITH DAMASCUS GOATS**

E.I. Shehata<sup>1</sup>, A.I. Haider<sup>1</sup>, A.M. Aboul-Naga<sup>1</sup> and E.S.E. Galal<sup>2</sup>

1- Animal Production Research Institute, Agriculture Research Center, Ministry of Agriculture, 2- FAO, Regional Office For Middle

### **SUMMARY**

An on farm trial was implemented in the north coastal desert zone of Egypt to increase productivity of Barki goat, dominant in the region, through introducing Damascus goats.

Sixty seven Damascus bucks (D) were distributed in 1984 and 1985 to growers, in a 100 km stretch, to be used for crossing with the native Barki (B) goats. Growers were chosen near settlements where demand on milk is higher and a better management for the crossbreeds may be afforded.

Feed-back information on the performance of the Damascus bucks and their progeny as well as the acceptability of the crossbred to the growers were obtained through three rounds of questionnaires, at different stages of the distribution process.

Results showed that Damascus and half-bred bucks were used along with the Barki. However, the number of Barki bucks in the flocks started to decrease by time where the average number of Barki used per herd was  $0.96 \pm 0.09$ ,  $0.87 \pm 0.16$  and  $0.63 \pm 0.09$  during rounds 1, 2 and 3, resp. Average number of half-bred bucks in the herds in round 3 when they could possibly have reached puberty was  $1.41 \pm 0.11$ , larger than that of Barki.

Total number of does in the reproductive age in the herds having Damascus or half-bred bucks was 1647.

Growers reported higher mortality rate among the progeny of the Damascus bucks ( $0.16 \pm 0.02$ ) than those of half-bred bucks ( $0.04 \pm 0.01$ ). Average age of half-bred does when first mated was  $10.4 \pm 0.17$  mo. The average grower stated that the half-bred does gave 1.28 times as much milk in their first lactation as the Barki doe.

A better growth performance was recorded for F1 goats, 1.5 time as heavy, while the back cross (1/4 D 3/4 B) was 1.34 time as heavy as Barki.

The general consensus among growers was that the introduction of the Damascus blood is quite acceptable. Evidence indicates that the system of introducing Damascus bucks can be self sustained, though it still require monitoring to allow breeders whose production condition able to manage higher Damascus gene proportion than 50% to be able to obtain it and to satisfy the high demand for the Damascus genetics.

**Keywords:** Local goats, Damascus crossing, productive performance

#### INTRODUCTION

Barki is the only goat breed raised on the coastal zone of Western Desert. It is well adapted to harsh grazing conditions and scarce vegetation (precipitation rate, 120 mm/year). Barki goats have low surplus milk production beyond that consumed by the kids, about 50 kg produced over 3 months post weaning and a reasonable litter size of about 1.8. The does have a small mature weight averaging 27 kg (Haider, 1984).

As transhumance is developing towards more settled sort of life, the ability of the native breed to withstand the hard condition and scarce of vegetation in the desert started to be not the only criteria concerned as breed character. More milk and meat production are required either to cope with the increased demand or to improve the economic output especially that costs of raising animals are increasing.

Utilization of Damascus goat as a more developed breed native to the Middle East, was considered as a possible mean for developing the productive potentiality of Barki goats. Damascus and its half crosses with Barki were reported to have more milk production than Barki (2.17 and 1.48 times, respectively) (Haider, 1982 and

Aboul-Naga *et al.*, 1985). The crossbreds were also reported to withstand the thirst and the exercise of walking for 7 hours without losing its ability for higher milk yield (Shalaby *et al.*, 1989 a & b).

This paper reports on a trial of introducing Damascus goats into the North Coastal Western Desert implemented by Animal Production Research Institute, Ministry of Agriculture, to improve Barki goat productivity.

#### **PROCEDURES**

The trial started by screening sites of high density of goat owners to convince them about the possible positive effects of introducing Damascus genetics. Starting early 1984, 67 Damascus bucks, in three batches starting early 1984, were distributed to goat growers, one each. Growers were chosen to meet three main criteria, having relatively large flocks, being receptive to innovations and expected to be able to disseminate progeny of the distributed bucks.

The bucks were given to the growers on loan basis with the help of an American International AID grant project. Later, when it was realized that the growers can manage the bucks and their progeny and that there was an obvious demand on the bucks, it was decided to give them away.

#### **Features of the target flocks**

The average flock size was  $54 \pm 5$  does in reproductive age. All had sheep/goats mixed flocks and may be classified as transhumant. These flocks were distributed over a 400 km stretch west of Alexandria in the North Western Coastal Desert (NWCD) with a depth of almost 15 km from the Mediterranean coast with one site as an exception in Siwa oasis, 350 km to the south. There were 23 locations all together.

Evaluation of the trial was achieved through three rounds using a questionnaire filled out for each visit dealing with vital statistics in the flocks, problems that may have faced the introduced bucks and their progeny and the performance of the Damascus bucks and their progeny relative to the Barki. The first round was shortly after dispatching the bucks, the second when they started to have progeny and the third when the progeny was expected to reproduce.

**RESULTS**

The performance of the distributed bucks is described in Table 1 representing the accumulated data collected from the questionnaires. The majority of the breeders perceived that the Damascus bucks were less vigorous than the Barki, however the home produced F1 bucks were either equal or better than the Barki in their vigor, sexual activity and fertility. Ninety five percent of the respondents said that the F1 bucks can breed all the year round but most of the producers reported seasonal sexual activity of the pure Damascus bucks, an observation confirming the findings on the experimental stations (Haider, 1983). The Damascus F1 buck's fertility reported to be high where number of does kidding per does joined being 0.81 to 0.91 in the three mating seasons studied.

Mean age of F1 bucks at first mating observed was approximately 17 MO, older than the Barki bucks which usually are about one year old when they are first used for breeding. It seems that as mature weight of the crossbreds is larger than the locals, longer time is needed for the males to come to puberty. However, this remark needs some more investigation.

Table 1. Summary of questionnaire results on performance data

Items	Rounds	Frequency (& percentage) of respondent		
		D or DB =B	D or DB >B	D or DB <B
D Buck vigor:	1	9(20)	16(35)	21(45)
	3	12(24)	2(4)	37(72)
DB buck vigor	3	45(88)	6(12)	0(0)
Weight of D buck progeny	1	6(13)	40(87)	0(0)
Growth of D buck progeny	1	7(15)	39(85)	0(0)
D buck sexual activity	3	26(51)	10(20)	15(21)
DB buck sexual activity	3	37(73)	13(25)	1(2)
Mortality rate among progeny of D bucks	1		.08 ± .02	
	2		.29 ± .02	
	3		.13 ± .01	
Mortality rate among progeny of DB bucks	3		.04 ± .0	

D:Damascus, B:Barki and DB:crossbred between them.

Crossbreed does were reported to produce 1.44 times



milk as the Barki (Table 2). Possibility to attain more increment in milk production exists because the average age of the crossbred does, at time of collecting the data, was less than that of the Barki and that the majority of the former had not reached maturity to show their full production potential.

Table 2. Collected data on crossbred does performance

Data on milk production;	DB= B	DB= 1.5 B	DB= 2B	DB >2B
Milk production	5(13)	34(87) <sub>1</sub>	0	0
Data on lactation duration and reproductive performance:				
	DB >B	DB= B	DB <B	
Duration of lactation	1(3)	23(64)	12(33)	
Twinning rate	0	37(95)	2( 5)	
Reproductive seasonality	0	33(97)	1( 3)	

1. Frequency of respondents and their percentage of total respondents.

While 87% of the respondent reported that F1 does gave more milk than the Barki, only 33% reported that the crossbreds had longer lactation than the Barki. This implies that the increase in milk yield was realized mainly through the greater daily milk yield.

Only 5% of the respondent said that F1 gave more twins than the Barkis while 95% said that both breed groups were similar (Table 2).

The average age at first mating in F1 does reported was 10.4±0.17 mo. As compared to the Barki the average respondent reported that F1 goats were 1.5 time as heavy while the backcross (1/4 D. 3/4 B) was 1.34 times as heavy as the Barki.

Mortality rate among D bucks was high, ranging from 0.08 to 0.29 in different rounds, while it was lower in their progeny of F1 (0.08) and similar to that reported on Barki bucks (0.08).

Management information is summarized in table 3. Damascus bucks were somewhat less able to graze under harsh condition of Egyptian desert compared to Barki, while their progeny was quite comparable. On the average, there was no preferential feeding treatment given to Damascus and F1 bucks. Only few breeders reported some problem in mating due to the relatively large size of the Damascus bucks. While there were some

health problems reported with the Damascus bucks, none was reported with F1's.

It is noticed that proportion of Damascus progeny saved for breeding decreased from round 2 to 3 (from .21 to .15) and the progeny of DB also reduced from .58 to .34. This trend mostly is a result of saturation of the basic flocks received Damascus bucks with Damascus genetics.

Table 3. Summary of management information in the questionnaires

ITEM	Frequency (& percentage) of respondent			
	D or DB Round	D or DB =B	D or DB >B	<B
Ability of D buck to graze	3	21(41)	2(4)	28(55)
Ability of offspring to graze	3	47(92)	3(6)	1(2)
Problems at mating due to disparity in size	1	4(9)	42(91)	
Health problems faced D bucks	1	10(22)	36(78)	
	3	22(43)	29(57)	
Health problems faced DB bucks	3	All	non	non
Proportion of D male progeny saved for breeding,			R2 .21±.05	
			R3 .15±.05	
Proportion of DB male progeny saved for breeding			R2 .58±.06	
			R3 .34±.03	
Proportion of D male progeny sold for breeding			R3 .20±.03	
Proportion of DB male progeny sold for breeding			R3 .06±.02	
Average stay of D buck in the flock			R3 31±2 mo	
Mode of disposal of D bucks (round 3):				
Still keep			26 (52)	
Death			16 (32)	
Return to station			8 (16)	

D: Damascus, B: Barki and DB: Their crossbred

The rate of disseminating Damascus blood among Bedouin flocks is difficult to be stated. Over the three seasons reviewed there were an average of 8.8 young crossbred bucks per flock sold for breeding purpose for neighbor flocks while still 32.2 crossbred bucks per flock marketed without knowing type of use. The total number of young crossbred bucks sold for breeding purposes amount to 528 up to 1989. It was reported also that crossbred bucks sold for higher prices than locals (1.5 times as high as his Barki similar).

Liviability of Damascus bucks was shown reasonable where after 4 years of distribution 52 % still kept with

beduins, 32% died and 16% did not perform well or for some reason not being welcomed and returned to Station.

Table 4 shows some statistics which help to indicate the degree of acceptability of the crossbred goats to the producer. These producers ceased to receive breeding stock from the distributing agencies and depended on themselves in changing the genetics of their flocks.

Among respondents reviewed, (Table 4) the average number of bucks is 1.83 per flock, of which 29% were Barki and 71% crossbred (home produced). The growers participating in the trial averagely changed the genotype of their flocks from 100% Barki does to 53% Barki and 47% Damascus stock. The average number of does assigned by the breeders to Damascus or F1 buck increased from the 1st season to 3rd season, being 24, 26, 38 does, respectively. This represented 53%, 58% and 84% of the total number of does in the flocks, respectively. Number of does kidding from Damascus or F1 bucks, number of crossbred does kidding and number of kids sired by non Barki bucks followed similar trend.

Table 4. Summary of vital statistics in the questionnaires

Items	Round	No1	Estimate±S.E.
No. of B bucks in the flocks	1	46	.96± .09
	2	30	.87± .16
	3	51	.63± .09
	3	46	1.41± .11
No. of pubescent B does in the flocks	1	44	54.00± .5
	2	30	49.00± .4
	3	51	32.00± .2
	3	51	10.00± .1
No. of pubescent DB does in the flocks	1	39	.49± .04
	2	26	.64± .08
Preparation of pubescent does served by non Barki bucks	2	26	13.00±1.00
	3	26	12.00±1.00
	3	20	10.00±1.00
No. of DB kids weaned	3	17	7.00±2.00
No. of DB female off spring served	3	17	7.00±2.00
No. of DB female progeny kidding	3	17	7.00±2.00

1- Number of respondents.

D: Damascus, B: Barki & DB: The crossbred between them.

#### CONCLUSION

Damascus bucks able to prove, within majority of the breeders, reasonable rate of success either in its

performance or in its impact on improving production performance of their progeny, i.e., milk production of females and growth performance of males.

Adaptability problems were minimum for Damascus and negligible for its progeny.

The impact of the trial implemented from the view of sustainability and success to modify genetics of local Barki dominate in the desert is partially worthy. However, it may require continuity of monitoring the process to allow breeders whose production conditions allow for higher Damascus gene proportion (over 50 %) to obtain it. Supporting breeders had a good experience with the Damascus bucks and still keeping them with Damascus does could be of good hand for self sustainability of the gene.

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## تحسين إنتاجية الماعز الصحراوية بالساحل الشمالى الغربى بمصر بالخلط بالماعز دمشقى

عصام شحاته<sup>١</sup> - عادل حيدر<sup>١</sup> - عادل أبو النجا<sup>١</sup> - صلاح جلال<sup>٢</sup>

١- قسم بحوث الأغنام والماعز، معهد بحوث الإنتاج الحيوانى، مركز  
البحوث الزراعيه، وزاره الزراعه المصريه. ٢- الأمم المتحده، مكتب الفاو  
لشئون الشرق الأوسط.

قام معهد بحوث الإنتاج الحيوانى- مركز البحوث الزراعيه بمحاوله  
لتحسين إنتاجيه الماعز الصحراويه بالساحل الشمالى الغربى بمصر. تضمنت  
المحاوله توزيع سته وسبعون ذكر ماعز  
دمشقى. بدأ من برج العرب حتى السلوم لخلطها بالماعز المحلى. ولقد  
روعى فى إختيار المربين أن يكونوا ممن لهم صفه الأستقرارية بمناطق  
التجمع حيث تزيد الحاجه إلى الألبان وحيث يتاح للمربين امكانيه تقديم مزيد  
من الرعايه لقطعانهم.

تم التعرف على أداء هذه الطلائق والخلطان الناتجه منها وكذلك مدى تقبل  
المربون لهذه السلالات من خلال ثلاث جولات متزامنه مع المراحل  
الإنتاجيه المختلفه بتلقى المعلومات على إستجاب أعد لذلك.

أظهرت الأستجابات تزايد اعتماد المربين على التيوس الدمشقى والخليط  
حيث تناقص عدد التيوس البرقى بالقطيع من ٠٩٦ و٠ إلى ٠٨٧ و٠ ثم إلى  
٠٦٣ و٠ بتعاقب الأستجابات. وبالنسبه لطلائق النصف دمشقى فلقد وصلت  
نسبتها بالقطيع إلى ٠٤١ و٠ فى الأستجاب الثالث حيث قرب عمرها من  
البلوغ. وصل متوسط عدد العنزات البالغه بالقطعان الموزع عليها  
الدمشقى ١٦٤٧ عنزه.

إستخلص من النتائج إرتفاع نسبه النفوق بين التيوس الدمشقى ( ٨-٢٩٪ )  
فى حين كانت النسبه ٨٪ فقط بين الجديان النصف دمشقى. ولقد وصل  
متوسط العمر عند أول تلقيح للعنزات خليط ١/٢ دمشقى ١٠٤ شهر. كما  
زاد إنتاج اللبن فى خليط النصف دمشقى حيث كان ١٠٢٨ مره مثل البرقى  
رغم أنهم فى أول موسم حليب. كما سجلت أيضاً مواصفات نمو أفضل  
حيث كان ماعز الجيل الأول من الخلط أثقل بمقدار ١٥ مره وماعز الربع  
دمشقى أثقل بمقدار ١٣٤ عن الماعز البرقى.

وبصفه عامه كان الرأى السائد لدى المربين مؤيداً لجدوى الخلط بالماعز  
الدمشقى فى التحسين وهذا يعد مؤشر جيد لإمكانيه نماء السلالات الجديده  
بيسر. ومع ذلك يلزم القول بأنه مازال من المطلوب إستمرار توفير الوسيله  
وخاصه لكبار المربين القادرين على الوفاء بالإحتياجات المترايده لتكثيف  
نسبه دم الدمشقى بمصادر للماعز الدمشقى النقيه.