J. of Animal and Poultry Production, Mansoura Univ., Vol. 14(9): 105 – 112, 2023

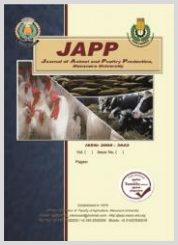
Journal of Animal and Poultry Production

Journal homepage & Available online at: www.jappmu.journals.ekb.eg

Review of Literature for Sheep and Goat RESEARCH and development in Egypt, Since the Forties: III. Local and Exotic Goat Breeds, Production Performance, and Breeding Programs

Aboul –Naga, A. M.*; Faten Abo Amo; E. S. Abdel-Aal; Etidal Hassan and M. Shafie

Animal Production Research Institute, ARC, Dokki Cairo, Egypt



ABSTRACT

Goats are the most efficient animals in converting poor feed resources into valuable food commodities, than other farm animals. It is emerged as a good source of food, income, and employment for rural societies, especially in less favoured environments. Distribution of goats in the country, under different production systems were presented. Four major local goat breeds are widely distributed in Egypt, i.e., Baladi in the Delta, Saidi in Upper Egypt, Barki in Western Desert and the Zaraibi (Egyptian Nubian) as potential dairy prolific breed, in northeast Delta. Minor local goat breeds are Wahati in the New Valley, Black Sinai in Sinai Peninsula, and Abou Ramada- Halaieb- Shalateen goats. Production performance (growth, reproduction and milk production) of the major local breeds reported in the literature are tabulated and discussed. Exotic breeds introduced to the country, i.e. Damascus, Alpine, Angora, Anglo Nubian, and Boer, along with their breeding and crossing programs with local goat breeds were reported. The authors recommended the promotion of the socioeconomic role of goats for the poor rural households and women; and taking an advantage of the goat adaptability to harsh conditioned, in the hot dry environment. Improving genetic potentials of Zaraibi goats for prolificacy and dairy characteristics, and crossing Damascus goats with Barki and Baladi goats are recommended for improvement of local goats.

Keywords: local goats, exotic breeds, production, reproduction, Egypt.

INTRODUCTION

1. Socioeconomic role of goats in Egypt:

Goats are among the early animals domesticated by the man and developed for his livelihood. They reproduce more than cattle, buffalo, and most sheep (Gall, 1975). Goats are more efficient than other ruminants in conversing poor feed resources into valuable food for human consumption (Devendra, 1976). However, in many countries goats are not raised an integrated economic enterprise, but rather are considered as "clean up" animals, supplying the family needs of food and cash. Goats are heavily spread worldwide, and have an important socio-economic role, especially in developing countries. In the last years, goat raising have become an important aspect of animal production in Egypt. Total goat's population is about 4.2 million heads (Ministry of Agriculture, 2014). They are emerged as favourable environments, where high crop production is uncertain, and rearing large ruminants is restricted by feed scarcity. They also possess number of desirable features that supported their compromises in diverse environmental conditions, e.g., limited initial investment requirements, high prolificacy, early sexual maturity, and low feed requirements. Dairy goat is known as "poor man's cow ", because of its immense contribution to the socio-economy of destitute farmers and small holders, in rural societies. Numbers of goat heads can be maintained easily by a man or woman and can be easily liquidated in times of crises. Goats are good supplementary source of income to the small rural household. They have a superior adaptability to arid conditions, due to their high capability to conserve water, travel for long distance, graze selectively wide variety of vegetation, resistant to number of infectious diseases, and could acquire more than one kid every year.

Goats are raised in Egypt for meat and milk, about 2.7% of the total meat produced come from goats (Ministry of Agriculture, 2014). Goat milk is usually processed to butter and cheese, mostly consumed by the family or, sold on a small scale in the local markets. Out of the national Gross Domestic Product (GDP) from agriculture, goat contribute 8% of animal production GDP (Galal et al., 2005)

2. Goat distribution in Egypt

Livestock population surveys in Egypt are conducted by species per governorate, not by breed. However, distribution of goats by breed was approximately inferred from the geographical surveys by ICARDA for characterization of small ruminants' genetic resources in West Asia and North Africa region (De Pauw et al., 2011, Fig1). There are four major Egyptian goat breeds, three of them are widely distributed in the country; Egyptian Baladi goats in the Delta, Saidi goats in Upper Egypt, and Barki goats in the north Coastal Zone of Western Desert. The fourth major breed is the Zaraibi goats (Egyptian Nubian), which having high reputation as potential dairy prolific breed, raised in northeast Delta. There are other minor local breeds; such as Wahati goats in the New Valley, Black Sinai in Sinai peninsula, and Abouramada- Halaieb- Shalateen goats (AHS), in Halaieb-Shalateen triangle.

3. Goat's production systems:

The prevailed goat production systems in Egypt are:

- **Semi Intensive System:** In this system, goats are owned in small numbers, few heads per farmer. Mating is practised by leaving males with females all the time. Feeding is managed by scavenging and grazing crop residues and

* **Corresponding author.**
E-mail address: adlmaboulnaga@gmail.com
DOI: 10.21608/jappmu.2023.222814.1082

grasses growing on the irrigation canal sides. Supplementary feeding is rarely offered. Males are fattened on concentrates for slaughtering at special events.

- **Extensive system:** is revealed in the desert areas, on natural ranges, which are available for 3-5 months depending on the levels of rain falls. Out of rainy season (drought season), animals depend on supplementary feeding such as barely grains, barely straw and crop by-products by selling some of the animals.
- **Household system:** under this system goats play significant role in the food chain, and the livelihoods of the poor rural households, mostly women and children. They adopt low input/low output system, combined with lack of modern agriculture practices (poor feeding and housing), inappropriate breeding and poor health control.
- **Mixed crop-livestock system:** this system consists of integrated crop and livestock activities. Livestock depend on extensive grazing of natural veld and crop residues during the dry season. This is a closed system in which waste products of cultivated crops are used by the livestock, and in turn return its own waste (manure) back to the crop fields.

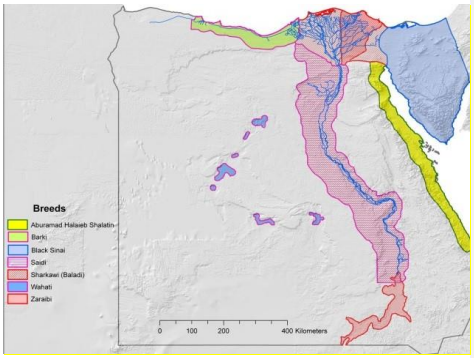


Fig. 1. Distribution of local goat breeds in Egypt.

Table 1. Goat production systems, main products, and market possibilities.

Breed	Production system	Main products	Market demand and possibilities
AHS goats	Extensive grazing, transhumance	Meat	moderate demand due to small human population but could increase if good road/rail transportation are established
Barki goats	Extensive grazing, transhumance	Meat	high demand, due to popular internal demand, particularly when sold young .
Black Sinai	Extensive grazing	Meat	moderate demand due to small human population
Egyptian Baladi	Mixed crop-livestock	Meat	high demand, due to popular internal demand, particularly when sold young .
Saidi goats	Mixed crop-livestock	Meat	high demand, due to popular internal demand, particularly when sold young .
Wahati goats	Mixed crop-livestock	Meat	moderate demand due to relatively small human population
Zaraibi goats	Mixed crop-livestock	Meat, milk	high demand, high milk production for processing, and high twinning rate

Table 2. Management calendar in different systems

Breed	Mating season	Pregnancy	Kidding season	Lactating	Grazing	Concentrate feeding
AHS	Jun.-Jul.	Jul.to Dec.		Nov.-Feb.	All the year	May to Nov.
Barki	All year round, Increased May to July	All year round, increased Jun-to Nov.	All year round more in Oct.-Dec.	All year round, more in Oct.-Feb.	All year round more in Nov.Apr.	Jun.to Oct.
Black Sinai	Jun.-Jul.	Jul.to Dec.	-	Nov.to Feb.	All year round	May to Nov.
Egyptian Baladi	All year round	All year round	All year round	All year round	All year round	All year round
Saidi	All year round	All year round	All year round	All year round	All year round	All year round
Wahati	All year round	All year round	All year round	All year round	All year round	No
Zaraibi	All year round	All year round	All year round	All year round	All year round	All year round

Goat breeds in Egypt.

1. Main local breeds

Zaraibi goat (Egyptian Nubian)

The breed was named "Zaraibi" as bred in confinements in the peri-urban areas, known as (Zaraba), and was named "Egyptian Nubian'' after Nubba region, the first area where the breed had been originated. At present, the breed exists mainly in the Northeast Delta region. It was reported to be one of the progenitors of the standard Anglo-Nubian goats (Devendra, 1976). It has very recognisable and distinct convex profile, distinguished Roman nose, with many animals having undershot jaw (Annex1). They are very prolific goats and have good reputation for their lactation performance (Galal., 1987). Both genders rarely have horns, ears are long, pendulous, and drooping, body is covered with short hair.

Aboul-Naga and El-Shobokshy (1981) described the breed as a medium size, long legged, with long pendulum ears and distinguishable roman nose. Short horns could be present in both genders but are usually absent in most individuals. The predominant colour is brown with white or dark spots; however, black individuals are frequently found with white or pied spots. Zaraibi goats are considered as a potential local breed, it produces relatively high amount of milk, averaging 240 kg in 6.5 months' lactation period (Abd-El-Reheem, 1998; Aboul Naga et al., 2012), an have satisfactory mature body weight up to 70 kg (Galal, 1985).

Early in the eighties of last century, an interest trial was carried out by Animal Production Research Institute to establish a nucleus herd of Zaraibi goats, and series of studies had been carried on. Aboul-Ela et al. (1988) reported variable ovulation rates, ranging from 1 to 6, with a mean of 2.6 ova's. Abdel-Raheem (1998.) reported normal oestrous cycles occurring in autumn and winter (15 – 24 d), whereas high incidence of long cycles was observed in the summer (37%), short cycles (<14 d) were reported in the spring. Supplementary feeding during pre-mating and mating periods (flushing) increased significantly ovulation rate of Zaraibi goats (Aboul-Ela and Aboul-Naga, 1987). Breeding season seems to be restricted to nine months, with anoestrus period in summer months (Shalash et al., 1970). Zaraibi does usually kid once a year (Mousa, 1988).

Milk yield of Zaraibi does range from 96 to 208 kg (Table 3) in a lactation period of 10 to 29 weeks (Aboul-Naga et al., 1987). In two different trails, Galal (1987) reported 240 kg of milk over periods of 230 days, and 239.7 kg over 197.6 days. Zaraibi milk contains 4.23, 2.59, 12.56 and 0.74% butter fat, protein, total solids and ash, respectively (El-Gallad et al., 1988).

Effects of feeding level on milk yield, fat percentage, lactation length, birth and weaning weights, were stated by Soryal and Metawi (2000) and by Faten Abo Ammou . et al. (2006).

The results of fattening Zaraibi kids for 100 days at 5 months of age were reported by Said (1983), feed efficiency was 6.53 TDN/ kg gain, with daily gain of 55 g, and dressing percentage of 39.4 to 46.4 %. Meat percentage was 69.3 to 75.0%, separable fat was 5.0 to 12.6%, bone % was 16.1 to 20.0, and lean to bone ratio ranged from 3.8:1 to 5.2:1; with an average of 4.3:1 (El-Gallad et al., 1988.). Dietary energy supplementation pre-and during mating had beneficial effects on the performance of Zaraibi kids. Multiple births is common in Zaraibi goats, causing light weight of kids at birth, consequently, high mortality rates might occur early in the kids life.

Table 3. Performance of main local Egyptian goat breeds.

Breed / Trait	Barki	E. Baladi	Zaraibi
Growth performance			
Birth weight (kg)	2.28 (M+F)*[1]	1.7(M+F)[3]	2.4 (M) ,1.9 (F)[6]
		1.8(M+F)[4]	2.1 (M+F)[9]
			2.3 (M+F)[1]
Weaning weight (kg)	6.65 (M+F)[1]	6.1(M+F)[3]	10.2 (M) ,8.1 (F), 9.2 (M+F)[6]
		7.7(M+F)[5]	6.4 (M+F)[1]
Yearling weight (kg)	25.7 (F)[2]	12.0(M)[6]	19.6 (M) ,18.5 (F)[6]
	17.1 (M+F)[1]	10.5 (F)[6]	18.0 (M+F)[1]
		11.2 (M+F)[6]	20.7 (M+F)[10]
Mature weight	25 – 30 (M+F)[1]	31-45(M)[7]	25.0-40.0 (F)[9]
	26.1 – 42.4 (F)[2]	26.0 (F)[8]	
Pre-weaning weight gain (g/dy)	78 (M+F)[1]	53.1 (M+F)[5]	62.4 (M+F)[6]
		64.1 (M+F)[4]	73.8 (M+F)[1]
		22.3 (M+F)[6]	35.7-41.8 (M+F)[1]
		40.0 (M+F)[3]	38.6 (M+F)[10]
			46.8 (M+F)[6]
Reproduction performance			
Oestrus cycle (days)			15-24[15]
Ovulation rate			2.6[1]
Age at first kidding (months)	18.8[11]		
Fertility rate	88[11]	86[1]	
Abortion rate	10.5[12]		
Kids born/doe exposed	1.07[1]	1.48[1]	
kids born/doe kidded	1.27[1]	1.95[1]	
kids weaned/doe kidded	0.90[1]	1.39[1]	
kgs weaned/doe kidded	8.72[1]	15.5[1]	
Twining rate	16[13] - 54[12]	1.95[1]	1.81 (1.57-1.96)[13]
Abortion rate	10.5[12]		
Mortality rates up to weaning	8.2 (7.7-9.4)[12]	41[14]	25[1]
Milk production			
LL*(W)20.4 (9-24), S*	70.4 (38.9-99.8)[1]		
LL (W) 21.4 (11-27), T*	98.9 (51.0-47.3)[1]		
LL: 3.5, Mo.		72.8[16]S - 95.9[16]T	
LL: 5.0 Mo.		97.4[16]- 126.7[16]T	
LL: 7.0 Mo.		111.0[16]-147.3[16]T	
LL 22.3 W, S*			96.3 (53-164)[17]
LL 23.3 W, T*			108.6 (64-172)[17]
LL 19.2 W, S			97.2 (70-130)[17]
LL 17.6 W, T			97.6 (62-129)[17]
LL 22.8 W, Q*			162.1 (123-208)[17]
Butter fat (%)	3.61-3.93[17]	4.08[17]	4.23[18]
Total solids (%)	10.8-11.8[17]	8.6[17]	12.56[18]
Protein (%)			2.59[18]
Ash (%)			0.74[18]

***M: male, F: female. LL: lactation length; W: weeks; Mo.: months; S: Single; T: Twins; Q quadratic**

1: Aboul-Naga et al., 1987; 2: Shehata et al., 1989; 3: Ashmawy, 1982; 4: Hassan et al., 1982; 5: Abdel-Salam, 1991; 6: Shalash et al., 1970; 7: Hemeida, 1985; 8: Abdel-Fattah, 1990; 9: Abdel-Monaam, 1986; 10: El-Gallad et al., 1988; 11: Galal (1987); 12: Aboul-Naga et al. (1985); 13: Aboul-Naga and El-Shobokshy (1981); 14: Tantawy and Ahmed, 1960; 15: Aboul-Ela et al. (1988); 16: Ashmawy, 1982; 17: Sirry and Hassan, 1954; 18: El-Gallad et al., 1988

Selection plan for improving Zaraibi goats.

Long term selection program was applied on the Zaraibi nucleus herd at APRI since 1983. The does were mated once /year in (October) till 1992, thereafter, they were mated in two seasons (June and October). Starting from 2000, selection indices were designed and applied for both males and females. The indices included (4- and 12-months weights, first parity, total milk yield and milk yield of their dams).

Table 4. Estimates of genetic gain in the Zaraibi nucleus herd

Genetic gain		Period	Reference
Milk yield (kg/year)			
0.690		1995-2008	Hamed (2010)
0.720		1987-2008	Aboul-Naga et al. (2012).
0.215		1990 - 2014	Rasha Mohmed (2020)
Body weight (kg/year)			
Weaning weight	0.304	1987-2008	Aboul-Naga et al. (2012).
Weaning weight	0.033	2005-2012	El-Awady et al. (2019).
120-dys weight	0.091	1988-2018	Rasha (2020)
180-dys weight	0.072	2005-2012	El-Awady et al. (2019).
Yearling weight	0.158	1988-2018	Rasha (2020)

Egyptian Baladi goats:

Baladi goats have been reported as a good fertile, prolific, non-seasonal breed, able to produce more than once per year (Galal, 1987; Tantawy and Ahmed, 1960). Growth rates of Egyptian Baladi goats is generally low with variable daily gain (Table 4), which reflected dlow capability for meat production. Provision of improved feeding system during late pregnancy and lactation increased growth performance of the kids. High average daily gain from birth to weaning are justifiable, assuming that the kids are being fed on concentrate feeds. On farm trials showed that average kidding rate of Baladi goats ,under small farmer conditions in Delta, rate was 2.2 kid/doe.

Weight gain of Baladi kids is associated with milk intake during the suckling period. Daily gain of kids up to weaning averaged 56.5 g, but higher estimates were reported for the first 28 days of kidding. Fattening of Baladi kids is widely practiced by goat owners at 6-8 months of age for a period of 4-6 months (Lotfi and Youssef, 1968). Breeding season seems to be profound to nine months from September with anoestrus period from January to March (Shalash et al., 1970); does usually get birth once a year (Mousa, 1988).

Baladi goats can cope with the adverse subtropical climate of Egypt. Furthermore, they are able to maintain their physiological and production parameters high Temperature Humidity Index (THI) up to 80. Reduction in milk yield, biochemical (serum total protein and glucose) and haematological (leucocytes count) indices have been reported at THI value more than 80. Appropriate strategies to alleviate negative impacts of thermal stress on Baladi goats were successful. Mortality rate of Baladi kids up to weaning reached 41% for multiple birth kids (Tantawy and Ahmed, 1960), with a range from 6.4% in spring to 61.3% in winter (Shalash et al., 1970)

Commented [T1]: تحتاج الى توضيح (غير مفهومه

Barki goats:

Barki (or Saharawi) goats are raised along the coastal zone of Western Desert, characterized with small head and straight profile, males and most of females have horns. Ears are medium and drooping (Galal,1987). Colour is mainly black with white spots on the head and the body, there are incidences of other colours (Annex1). The body is covered with long hair. Barki goats are known to be hardy animals

with fertility rate over 80% per crop, and have medium twining rate (150%), and good ability to breed more than once/year (Aboul-Naga et.al.1985). The breed is well adapted to the natural ranges and scarce vegetation in the desert areas. Barki goats are generally has low milk production, low growth rate, however, they are highly fertile and able to breed all the year round.

Average body weight at birth, weaning, one-year old, and adult are 2.28, 6.65, 17.1 and 25-30 kg, respectively. Growth rate up to weaning was 78 g/day for both sexes (Aboul-Naga et al.,1987). Fattening of Barki male kids is practiced at 5-6 months of age for 100 days (Aboul-Naga et al., 1985).

Milk production of Barki does is relatively low, averaging 81.5 kg in a lactation period of 145 days (Table 4). Barki milk contains 3.61 to 3.93% fat and 10.8 to 11.8% total solids. Does are bred throughout the year, and two kid crops per year is common. Females are usually bred when reaching one year of age.

Saidi goats:

The breed is spread all over Upper Egypt, however, only few reports are available in the literature on their performance. Oestrus synchronization of Saidi goats carried out by Abdel-Ghani et al. (2015), was successful in high incidence of multiple kidding. This breed is known for their adaptation to hot dryconditions in Upper Egypt, and able to tolerate temperature fluctuations throughout the day (Aboul Naga et al., 2021). Saidi goats proved to be more genetically distinct than other local breeds (Aboul Naga et al., 2023). Recently, Abd Elgaber (2023, personal communication) revealed that production performance of Saidi goats was as follow: services per conception 2.3, twinning rate 1.88, birth wight 1741 g (ranged from 900 to 2900 g) for males and 1381.3 g (from 950 to 2200 g) for females. Mortality rate of kids till weaning was 12.5%, milk yield in 22 weeks was 598.9 g and ranged from 300 to 1150 g, and kid growth rate was 41.4 g/day with a wide range from 23.6 to 70.3 g.

Investigating the production system of Saidi goats in Assiut and Aswan Governorates, Abdel Sabour (2023, under publication), reported that Saidi goats are raised in small herds mixed with sheep flocks . They are generally of low performance than both Barki and Wahati goats have medium twinning rate and high kid mortality.

2. Minor local goat breeds:

Abouramad -Halaieb -Shalateen (AHS).

AHS is the smallest Egyptian goat breed in body size, found in the triangle Abouramad-Halaieb- Shalateen. Average body weight is 20 kg with long black hair but sometimes red or white. Both genders are often horned. Fertility ranges from 88 to 94% and average litter size from 1.30 to 1.45. Milk yield in 16 weeks lactation, kidding ranges from 23-39 kg (Desert Research Centre, 1996)

Black Sinai goat

Little performance estimates are available about the Black Sinai goat, however, animals are known to be hardy goats and having small body size (16-26 kg), they are extremely tolerant to the thirst (Maltez and Shkolnik, 1979). Even when they are lactating, they drink only once every 2 days and can graze far away from the water points. The ability of these goats to withstand water depravation without any effect on milk yield is surpassing any other desert animals (Shkolnik and Choshniak, 2000). Once there have access to water, they replenish their entire water loss.

Rain in Sinai is scarce, but occasional flash rains may cause floods and wide temperature diurnal variation. Signs of overgrazing and range degradation are evident infrequent drinking occurs when grazing is done at great distances from the watering sites. Kandil et al. (2012) studied the economic performance of Black Sinai goats under the breeder's extensive system and reported economic efficiency of 80.5 %,1.5,11.0 %,12,2 kg and 15.9 kg, for conception rate; twinning rate; mortality up to weaning; kg of kids weaned/doe joined; and kg of kids marketed /doe joined, respectively. Output/input ratio was 1.85; they concluded that improvement of management practices of Sinai goats could feasibly improve their performance substantially.

Wahati goat:

Named after the desert oases "Waha, in Arabic" in the New Valley Governorate. Body size is small (probably as small as the Black Sinai) (Annex1); average body weights are 28-35 kg in males and 21-26 kg in females. Both genders are horned; horns are relatively long with different shapes, but they are spiralling out with an upward inclination in males (Galal, 1987). Colour is mostly black, but some light colours may be found. The body is covered with long glossy hair. Milk production estimates are 30 to 40 kg in lactation period of variable duration. Information available on Wahati goats are limited, preliminary observations reported by the University of Al-Azhar indicated that number of kids born/doe is more than 2 kids/year, goats bred all the year-round (Galal, 1987). Wahati goats are tolerant to heat stress up to 50 ºC, of intensive solar radiation under the flock conditions in the New Valley (Aboul-Naga et al., 2021).

3. Exotic goat breeds:

Sands and McDowell, (1978) stated that improving milk production in the tropics could be achieved by the introduction of standard temperate dairy goat breeds, whom their milk production ranged from 350-950 kg, nearly double, the production of tropical goats. From the literature, only four of the European temperate dairy breeds have been bred successfully in the tropics, they are Saanen, Togenberg, Alpine, and Anglo-Nubian. Milk production of the imported breeds has been decreased by about 25-50% of their yield (Gall, 1975, Montaldo et al., 1978; NDRI, 1980).

Number of regional goats (Damascus and Angora) and international goat breeds (Alpine, Anglo-Nubian, and Boar goats) had been introduced to Egypt to improve milk and meat production of local goats, especially Barki and Baladi goats.

Damascus goat

Damascus goat breed (D) is the most developed dairy goats in the Near East. The breed had been introduced to number of countries in the region including Cyprus, Gulf countries, Israel, and Egypt. The successive selection program in Cyprus developed the breed to the international levels for milk yield and kid performance.

Early in the eighties of last century, batches of Damascus goats were imported from Cyprus to be crossed with Barki goats in the coastal zone of Western Desert (and later with Baladi goats). The largest trial was in 1983, included 78 Damascus bucks distributed on the Bedouin goat breeders, with the objective to introduce around 25% of Damascus blood to the region. The trial was assessed after

two decades with 59 breeders (Aboul Naga, et al., 2010). The Damascus crosses had the advantage of heavier weights, better body confirmation, and higher milk production. Damascus crossbred kids were 50% heavier in weight and price, 3 months earlier in maturity, double in milk production in 2-3 month (longer lactation season) than the Barki parent. The most important advantage is their well adaptation to the arid conditions of Western Desert, the only disadvantage reported by the breeders was their high feed requirements.

On farm trial of crossing Barki goats with Damascus, had resulted in increasing number of kids born per doe to be 1.196 (Aboul-Naga et al.1987)). Number of kids weaned per doe was 0.764, and milk yield averaged 159.9 kg throughout 17 weeks of lactation. The Damascus does had longevity up to the 9th lactation, achieving the highest milk yield and mature body weight (46.3kg) at their 4th parity. Their kids had good survival rate and are well adapted to the subtropical conditions.

Abdel Salam et al. (1991) reported that milk production and lactation period differed significantly between pure Barki and D crosses. Salem et al. (2000) reported that D X Barki crossbred goats had better milk properties than the Barki but less than the Damascus. Crossbreds D goats gave 76% more milk and more persistent yield up to the 27th week of lactation. Average daily milk yield for D crosses was around 1000g vs. 300g for Barki and 500g for Zaraibi goats.

Crossing Damascus with Baladi goats improved both their milk and kid production. Baladi does mated with Damascus bucks were of good fertility and high prolificacy. Aboul Naga et al, (1989) reported considerable demand by the breeders for D bucks to improve meat and milk production of Barki and Baladi goats in their herds

Angora goats:

An Angora herd was imported in the seventies from Turkey and raised at Borg-Arab Farm at the Coastal Zone of Western Desert, the goats performed reasonably well in the first years of importation but deteriorated thereafter. Number of does conceive, kids born and kids weaned per doe were 0.836, 1.140 and 0.860 in the first 3 years of importation, but declined to 0.623, 0.896 and 0.750 in the last 3 years (Latif et al.1978)

Angora and Barki kids performed closely at birth and weaning. Carcass weight, dressing percentage, body measurements, and offal weight were close in both breeds. Baladi goats had heavier prime cuts ($P < 0{\cdot}05$) than the Angora. The two breeds had similar percentage of edible meat (68·38 versus 68·7), lean (57·5 versus 57·4), and fat in the rib joint (10·9 versus 11·3). Hair production of Angora goats averaged 0.597kg annually from two shearing, being higher in quantity and quality than of the Barki.

Alpine goats:

Early in the eighties of the last century, French Alpine herd (200 pregnant doe kids and seven bucks) was imported to Egypt for the first time, they were bred as purebred in a private farm in Beheira Governorate for dairy production. Analysing the records of 50 French Alpine, 38 Zaraibi does, and 42 Alpine x Zaraibi crossbred kids in a private farm, Dakahlia Governorate, showed that Zaraibi goats were superior to the Alpine in their fertility, litter size at birth, weaning rates, and mortality (Aboulnaga et al., 1987). Alpine kids significantly grew faster than the crossbreds. Sex did not significantly ($P > 0.05$) affect body weights and average daily gains of kids, until 150 d of age. Alpine kids had better body compactness ($P < 0.001$), and body conformation than the crossbred kids ($P < 0.05$).

Crossing Baladi goats with either Alpine or Damascus breeds improved their milk and kid production. Does mated with either Alpine or Damascus bucks were of good fertility and higher prolificacy.

Boer goats:

Boer breed is meat type goats which have been introduced to different countries worldwide, including Egypt. They were crossed with Egyptian Baladi goats in order to improve their kid and meat production. The crossbreds were significantly heavier (about 25%) than the Baladi kids at birth, weaning, 6, 9, and 12 months of age, but were significantly lower than the Boar parent. Crossbreeding of local Baladi goats with Boer is becoming a method to improve meat productivity of Egyptian Baladi goats (Abd-Allah et.al., 2016).

Anglo-Nubian

The Anglo Nubian breed was developed in Britain in the 19th century (Gall 1996). It originated from crossing native Prick-Eared Old English goats, and a variety of lop-eared breeds from eastern Mediterranean, and north Africa, which had long ears and roman facial profile. Mason (2002) mentioned that only the two tropical breeds; Zaraibi (Egyptian Nubian) from southern Egypt and Jamna-Pari from India, were crossed with the British goat. Chitral breed from north Pakistan was also involved.

The imported Anglo Nubian to Egypt showed good fertility as the Egyptian Nubian, but they were less prolific and smaller body size. Their kids were heavier at birth and at weaning. However, kids had higher losses due to slow acting infection disease (Knee Arthritics, Aboul-Naga; personal communication)

CONCLUSIONS AND RECOMMENDATIONS

Goats are more efficient than other farm animals in conversing poor feed resources into valuable food for human consumption. From the socioeconomic aspect, goat rearing enterprises is superior potential as a promising source of income and employment for rural societies, especially the less favoured groups (landless, poor families and women). Few heads of goats can be maintained easily by a woman or children and can be easily liquidated in times of crises. Goat rearing is a low cost and supplementary source of income for rural destitute communities.

Local goat breeds proved to be well adapted to the prevailed hot dry conditions, with good capabilities for water conservation, travel for long distance, graze selectively wide variety of vegetation, resistance to number of diseases, produce and reproduce under harsh environmental conditions, and are favoured than the standard breeds.

Improvement of the potential Zaraibi goat proved to be successful. National program for improvement of Zaraibi goats is highly recommended to improve their milk production, while keeping their high prolificacy and reasonable body size. Such programs require good collaboration with the breeders and local communities to carry out these tasks.

Damascus breed (D) is well developed dairy goats in the region. They prove to be well adapted to the hot dry environment conditions and have been successful in different countries of the Near East. They have been crossed successfully with Barki and Baladi goats in Egypt, doubling their milk production and realized 50% increase in kid weight and price.

Annex 1

Zaraibi Goats

E.Baladi Goats

Saidi Goats

Barki Goats

REFERENCES

Abd-Allah. S, M. I. Mohamed1, H.H. Abd-El Rahman and R. I. EL-Kady (2016). Assessment of some productive performance of Boer comparative study on reproductive and productive performance of Boer goats with Egyptian Baladi goats. Inter. J. Chem. Tech Res., Vol., 9:259-265.

Abdel Raheem, A.A. (1998). Genetic studies on Zaraibi goats. Ph.D. Thesis, Fac. of Agic., Ain Shams Univ., Egypt.

Abdel-Fattah M.T. (1990). Studies on sexual behaviour in goats under semi-arid conditions. M.Sc. Thesis, Fac. Agric., Al-Azhar Univ., Cairo, Egypt, 69-71

Abdel -Ghani,M.A.; Hyder M.;Abou-Khalil ; Derar ,F.F. and Abou Ammou ,El-Shafie, M.H. and Abdelkhalek ,T.M. and Hamdon ,H. (2015). Reproductive performance, ovarian vascularization, follicular dynamics and blood hormones after oestrous synchronization of Saidi goats. Egyptian. ,j,Anim.Prod.52Suppl.Issue :53-61

Abdel-Monaam A.U., (1986). Studies on milk yield of Egyptian Nubian goats. M.Sc. Thesis, Faculty of Agriculture, Cairo University, Giza, Egypt. pp. 88

Abdel-Salam M.M., (1991). Phenotypic and genetic parameters for lifetime production of goats in Egypt. Alex. J. Agric. Res., 36 (3) : 11-27.

Abdelsalam M. M., Eissa M., Maharan G., Haider A. I. (2000). Improving the productivity of barki goat by crossbreeding with Damascus or Zaraibi breeds. Alexandria J.Agric Res .45.33-42.

Abdelsabour, T., Messad, S., Alary, V., Aboulnaga, A., Elsayed, M., Mansour, H. (2023). Estimation of Small Ruminant Productivity in Two Different Agro-Ecological Zones of Egypt. Arab Universities Journal of Agricultural Sciences (Under publication)

Aboul-Ela M.B., Aboul-Naga, A. (1987). Improving fecundity in subtropical fat-tailed sheep. In: New technology In: sheep production. (Edits.) Marie F., and Owen J., Butterworths, London, pp. 631-671.

Aboul-Ela M.B., Aboul-Naga, A., El-Nakhla S.M., and Moussa M.R. (1988). Cyclic activity, ovulation rate and breeding performance of the prolific Egyptian-Nubian goats. Proc. 11th Int. Cong. Anim. Rep. AI, Dublin, Ireland, No:545.

Aboul-Naga A.M. and A.S. El-Shobokshy, (1981) Productivity and reproductivity of some subtropical types of goats under confinement conditions. In : Nutrition et 111ystems d' alimentation de la chèvre, volume 2. Paris, France: ITOVIC-INRA (1981), 723-728.

Aboul-Naga, A., Aboul-Ela M.B., Mansour H., Galal E.S., Haider A., Shehata E., and Ferial Hassan (1985). Productivity and Management of Desert Barki sheep and goats in the semi-arid coastal zone. In: Arid Lands Today and Tomorrow. Proc. Of Int. Res. & Dev. Conference Tucson, Arizona, October 20-25, 1985.

Aboul-Naga, A., Hassan Ferial and Aboul-Ela M.B. (1987). Reproductive performance of local Egyptian sheep and goats breeds and their crosses with imported temperate breeds. In : L'evaluation des ovins et des caprins McditerraneCn, Recueil des communications, symposium "Philostios" Fonte Boa, Portugal 23-25 Sep., 1987. (Edits.): Flament J., et Morand-Fehr P., IECA, CEE, CEEA, Brucellas, Luxemburg. Pp: 260-272.

Aboul-Naga, A.M., Galal, E.S.E., Heider, A., and Almahdy, H. (1989). Improving desert Barki goats through the introduction of Damascus blood at the producer's level. 5th Scientific Meeting of CALAR, San Diego, U.S.A., 6-12 August 1989.

Aboul-Naga, A.M., Khalifa, H.H., Elbeltagy, A.R., Abdel Khalek, T.M.M., Elshafie, M.H., Anwar, M.M., and Rischkowsky, B. (2010). Tolerance to abiotic stresses in Egyptian Barki desert sheep and goats raised under hot dry conditions: individual variations. 10th International Conference on Dry Lands Development. 12-15 December 2010, Cairo, Egypt.

Aboul Naga, A., Hamed, A., Shaat, I., and Mabrouk, M.M. (2012). Genetic improvement of Egyptian Nubian goats as subtropical dairy prolific breed, Small Ruminant Research, 102: 125-130

Aboul Naga, A.M.; Abdel Khalek, T.;Hayder ,M.; Hamdon, H.;Abozed, G.; Abdel Sabour ,T.; and Shafie ,M.(2021). Adaptive capacity of Wahati Sheep and Goats Flocks to Desert Oasis Conditions in the New Valley of Egypt. Egypt Journal Anim. Prod,58:71-77

Aboul-Naga, A.M.; Alsamman, A. E. Nassa, K. H. Mousa, Mona Osman, T. H. Abdelsabour, Layaly Gama, M. H. Elshafie (2023) Investigating Genetic Diversity and Population Structure of Egyptian Goat Breeds, using SNP Genotyping. Small Ruminant Research 226 (2023) 107017. https:// doi. org/ 10. 1016/ j. smallrumres. 2023.107017

Ashmawy G.M., (1982). Milk production and growth rate in the Baladi goats Proc. 3rd Int. Conf. Goat Prod. and Disease, 10-15 Jan. 1982, Tucson, Arizona, U.S.A., 314

De Pauw, E.; B. Rischkowsky, A. Abou-Naga, H.R. Ansari-Renani, I. Boujen and O. Gursoy (2011). Using production environment description and GIS tools to identify potential natural environments r animal genetic resources. ICARDA Technical Document, Aleppo, Syria

Desert Research Center 1996. Development of Animal Wealth in Shalateen, Aburamad and Halaieb. First progress Report, March 1996, Desert Research Center, Cairo, Egypt,

Devendra and Buns (1976). Goat production in the tropics. Technical communications. Commonwealth Bureau of Animal Breeding and Genetics, No. 19 pp.xii+184 pp.

El-Awady, H.G., El-Moghazy, M.M, Abu El-Naser, I.A.M., El-Raghi A.A. 2019. Direct and maternal genetic trend estimates for growth traits of Zaraibi goats in Egypt using multivariate animal models. Int.J. Modern Biol. Med. 10(1),1-19.

El-Gallad, T.T., E.A. Gihad, S.M. Allam and T.M. El-Bedawy, 1988. Effect of energy intake and roughage ratio on the lactation of Egyptian Nubian (Zaraibi) goats. Small Ruminant Res., 1 (4): 327-341.

Faten F. Abou-Ammou. (2006). Country report on goat production in Egypt. Proceedings workshop on recent advances in goat production under arid condition. Cairo, April 10-13 (2006) p.p. 247-254

Galal, E.S.E. 1985. Improving of sheep production in Egypt through the introduction of exotic breeds. FAO Publication.

Galal E.S.E., 1987. Sheep and goat production and research in Egypt. In: Small Ruminants in the Near East. FAO Animal Production and Health Bulletin, 54 (1): 117-155.

Galal, E. S. E., Metawi, H. R. M., Aboul-Naga, A. M., & Abdel-Aziz, A. I. (1996). Performance of and factors affecting the small-holder sheep production system in Egypt. Small Ruminant Research, 19(2), 97–102.

Galal S., Abdel-Rasoul F., Anous M.R., Shaat I., 2005.On-station characterization of small ruminant breeds in Egypt. In: L. Iniguez (ed.), Characterization of Small Ruminant Breeds in West Asia and North Africa, Vol.2. ICARDA, Aleppo, Syria, pp.141–193

Gall C. (1975). Milk production from sheep and goat. World Anim. Rev., FAO, 13:1-8

Hamed, A. 2005. Genetic studies on Zaraibi goat. PH.D. Thesis, Fac. of Agric., Al-Azhar Univ., Egypt

Hassan N.I., H.M. El-Shaer, M.A. El-Ashry and A.M. El-Serafy, 1982. Nutritional studies on pastures indigenous to southern Sinai. 2- Effect of level of supplements on productive performance of sheep and goats. 6th Int. Conf. on Animal and Poultry production. Zagazig, Sep. 21-23, 1982, Egypt. Volume 1, 93-114 pp.

Hemeida N.A., 1985. The reproductive tract of the caprine Egyptian Baladi bucks Assiut vet. Med. J., 14 (28): 205-209.

Kandil, A.; El Sahaer,H. and Metawi,,H.(2012) Performance of Desert Black goat under extensive production system I North Sinai in Egypt .Options Mediterranean's CIHEAM 2012 p.213-217

Latif, M. G.; Abdelsalam,M. and Abdelaziz,M.N.(1978). Meat production characterization of Egyptian Baladi and Angora goats. Meat Science 20, 211-216.

Lotfi A.Y. and K.E. Youssef, 1968. Studies on goat mat: 1- The influence of age and sex on proximate composition of goat meat. Vet. Med. J. (Egypt), 15 (16): 119-130.

Maltez ,E,and Shkolnik ,A,(1979).Milk production in the desert: Lactation and water economy in the Black Bedouin goats ,JSTOR Collection

Mason, I.L. 2002. World Dictionary of Livestock Breeds, Types and Varieties. Rev. by Valerie Porter. 5 ed. CABI Publishing, Wallingford,UK 2002-XVIII, 3805

Mekawy, W. A.; H. Mansour; A. I. Haider and M. R. Anous. 2000. The use of random regression in the evaluation of genetic parameters for growth traits of Egyptian Zaraibi goat. 51st annual meeting of the EAAP, Netherlands, 21-24 August 2000.

MOA (2014). Ministry of Agriculture, Economic Agricultural Affair Sector (2014).

Mona, A. Osman, U.M. El-Saiad, M. El-Sayed and A.A. Raheem 2004. Comparison of Zaraibi, Damascus and Baladi goats in milk composition and somatic cell counts. Egyptian J. Anim. Prod., 41 (1): 39-48

Montaldo WH, Juarezla LA, Forat M. 1978. Factors affecting milk production lactation, body weight and litter lizi in a herd of goats in Northern México. Journal of Animal Science. 47, 242.

Mousa M.R., 1988. Seasonality of oestrous activity, age at puberty and postpartum anoestrus in Egyptian Nubian goats. M.Sc. Thesis, Fac. of Agric., Mansoura Univ., pp. 121.

NDRI (1980). The National Disease Research Interchange (NDRI).

Rasha Mohmed, M.A.2020. Estimation of genetic trends in some productive traits of Zaraibi Goat Flock using Quantitative and Molecular genetic methods. PH.D. Thesis, Fac. of Agric., Ain Shams Univ. Egypt

Said M.M., 1983. Studies on some production traits of Egyptian goats. M.Sc. Thesis, Fac. Agriculture, Al-Azhar Univ., Cairo, Egypt.

Salem SA, Agamym EI, Yousseff AM (2000). Physiochemical and nutritional characterization of milk of two Egyptian goat breeds. 7th Int. Conf. Goat., Vol. 11, France, pp. 618-620.

Sands, M. and McDowell, R.E., 1978. The potential of the goat for milk production in the tropics. Comell International Agriculture. Mimeograph 60, Ithaca, New York, 53 pp.

Shalash M., A. Mousa, M. Nawito, H.E.F. Farrac, F. Oof, M.K. Selim and M.A. Tawfik, 1970. Economic evaluation of some goat breeds in Egypt. Vet. Med. J. (Egypt), 17 (18): 295-312.

Shehata E., A., Heider, A.M. Aboul-Naga, E.S.E Galal, H. Mansour and H.M. Al-Mahdy, 1989. Assessment of performance characteristics of sheep and goat in the North Coastal Desert of Egypt. C.A.L.A.R.-Report.

Shkolnik, A., and Choshniak, I. (2000). Physiological responses and productivity of goats. Stress physiology in livestock, Chapter 3, volume II: Ungulates, pp 39-55.

Sirry I. and H.A. Hassan, 1954. Composition of goat milk in Egypt. Indian J. Dairy Sci., 7: 188-193.

Soryal K. A. and Metawi H. R., 2000. Future prospect of goats, as a source of milk, to decrease the milk gap in Egypt, Potential advantages of dairy goats, international symposium, prospects for a sustainable dairy sector in the Mediterranean. Hammamet - Tunisia: October 26-28, 2000.

Tantawy A.O. and I.A. Ahmed, 1960. Studies in Egyptian Baladi goats 1- Frequency of multiple births and sex ratio. Empire J. Exp. Agric., 28: 74

بحث مرجعي لابحاث وبرامج تطوير الأغنام والماعز في مصر منذ الأربعينيات: 3) الخصائص والأداء الإنتاجي للسلالات المحليه والمستورده من الماعز وبرامج التربيه

عادل محمود أبو النجا – فاتن فهمي -ايهاب صلاح-اعتدال حسن - محمد الشافعي

معهد بحوث الإنتاج الحيواني ، مركز البحوث الزراعية ، الدقي ، القاهرة

الملخص

الماعز هي أكثر الحيوانات المزرعيه كفاءة في تحويل مواد العلف الفقيرة إلى سلع غذائية ذات قيمة ، وقد تاكد دورها كمصدر جيد للغذاء والدخل والعمل في المجتمعات الريفية، خاصة في البيئات الأقل تفضيلاً. تم أستعراض بيان توزيع الماعز تحت أنظمة الإنتاج المختلفة. تنتشر أربعة سلالات محلية رئيسية للماعز على نطاق واسع في مصر؛ وهي :الماعز البلدي في الدلتا ،والماعز الصعيدي في الصعيد ، والماعز البرقي في الصحراء الغربية. والسلالة المحلية الرئيسية الرابعة هي الماعز الزريبي (النوبي المصري)، وهي سلالة متميزه في إنتاج اللبن وعالية الخصوبه،و تربى في شمال شرق الدلتا. وهنالك سلالات محلية ثانوية أخرى ؛ هي الماعز الواحاتي بالوادي الجديد ، ماعز سيناء السوداء في سيناء ، وماعز أبو رماداً- حلايب –شلاتين في الجنوب ، هذا وقد تم جدولة وعرض الأداء الإنتاجي للسلالات المحلية الرئيسية من حيث النمو والتكاثر وإنتاج الحليب، كما وردت في المراجع. كما تم استعراض السلالات الأجنبية التي تم استيرادها إلى البلاد ؛ مثل الدمشقي والألبين والأنجورا والأنجلو نوبيان والبور، برامج التربية لها ،خاصه الخلط مع الماعز البرقي والبلدي. وبناء على هذه النتائج أوصى الباحثون بالبرامج التاليه لتحسين الماعز المحلي: تعزيز الدور الاجتماعي والاقتصادي لها في المجتمعات الريفية الفقيرة ؛ -الاستفادة من قدرتها على التكيف مع الظروف السائده في المناطق الحارة والجافة ،- التحسين الوراثي للماعز الزريبي كسلالة خصبة وعاليه إنتاج اللبن ، - وكذا خلط الماعز البرقي والبلدي الماعز مع الماعز الدمشقي .