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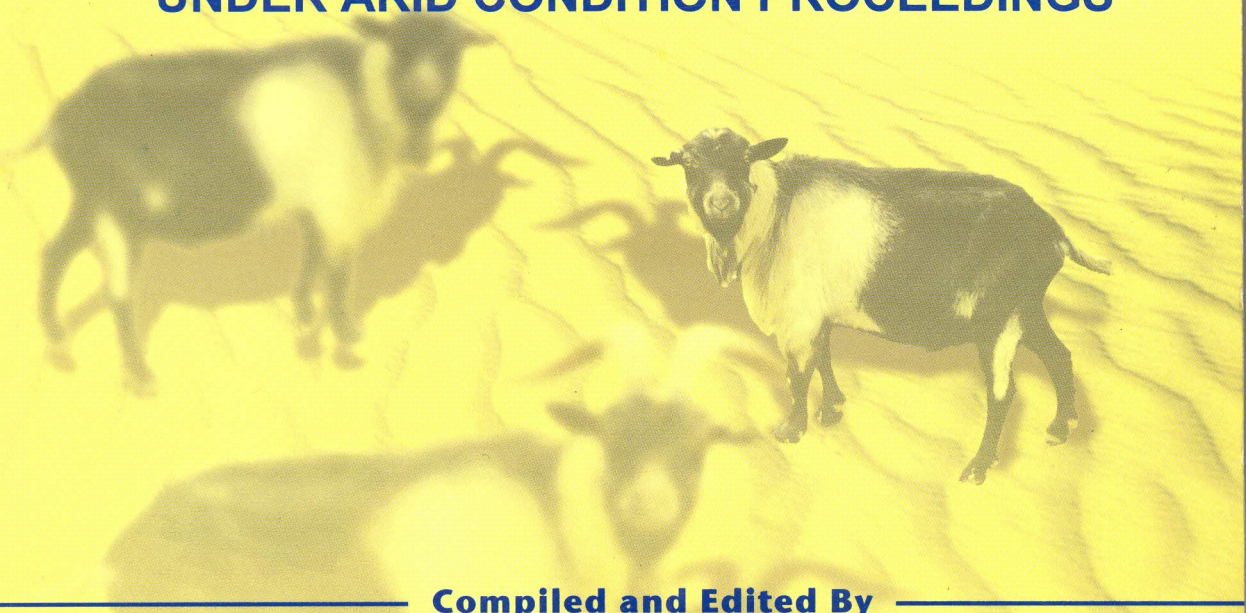


**Desert Research Center  
Ministry of Agriculture, Egypt  
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**United Nations  
Food and Agriculture Organization  
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# **REGIONAL WORKSHOP ON RECENT ADVANCES IN GOAT PRODUCTION UNDER ARID CONDITION PROCEEDINGS**



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United Nations  
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(FAO)

## Goat production in Libya

A. Ahtash

### Introduction

Libya is located in middle north of Africa ,their area estimation was about 1.6 million Km<sup>2</sup>. Mediterranean climate characterize the coastal region , however the climate will changed to desert condition as we go to the south. Great variation in climate temperature between winter and summer which ranged from 0 to 40 C°. Libya is considered to be within arid and semi-arid region which characterized by shortage and fluctuation of feed availability that is required to provide the feed requirement for the existence number of livestock. This resulted in low growth performance of animal production in this country.

### Livestock population:

Livestock population in Libya were fluctuated from year to year affected by the availability of feed. Table (2) showed the number of the different species during 1990-2004, where the goats represent the second rank in the population of livestock after sheep. The relative importance of goats as compared to livestock, comprises about 20-22% of the total animal unit during the above period. This reflect the

major role of the goats that can play in the future of animal population in Libya.

### Goat breeds and flock management

- Goat population in Libya ranged between 1.5-2 million heads, 90% of this number represents the local goat breed (Mahali) and were wide spread on the coast region. The rest 10% were concentrated in the south area and called Tebawi, Targi and Kurdi. Libyan goats were distributed in three different regions : 44% in the west region, 21% in the middle region, 33% in the east region and 2% in the south region (Map 1).

- Extensive production was the main system used for goat production in Libya. Goats were raised either independently or in form of mixed herds with sheep, also they were raise in large scale with small number of animals at rural region .

- The main systems of goat production were divided into:

- 1- Nomadic flocks of large size (200-300 heads).
- 2- Semi-migrated flocks with medium size (50-100 heads).
- 3- Intensive close system with small flock size (10-30 heads).

Table 1  
Meteorological measurement and geographical characteristics of the different regions where goats were raised.

| Geographical area     | Coastal plains                                                        | Mountain         | Desert        |
|-----------------------|-----------------------------------------------------------------------|------------------|---------------|
| Air Temp. (C°)        | 9-32                                                                  | 7 – 26           | 7 -38         |
| Relative humidity (%) | 63 -81                                                                | 50 – 70          | 25 – 48       |
| Annual rainfall (mm)  | 190 - 350                                                             | 400              | 8             |
| Altitude (m)          | 38 - 100                                                              | 400              | 200           |
| Vegetation            | Steppes margined with ranges plus Arar forests mixed with Pine trees. | Ranges & Forests | Desert Shrubs |

Table 2  
Livestock population in Libya during the period 1990-2004

| Year | Livestock species ('000 heads) |       |        |       |
|------|--------------------------------|-------|--------|-------|
|      | Goat                           | Sheep | Cattle | Camel |
| 1990 | 1 500                          | 4 500 | 180    | 127   |
| 2000 | 2 066                          | 6 199 | 148    | 116   |
| 2004 | 1 800                          | 5 700 | 127    | 102   |

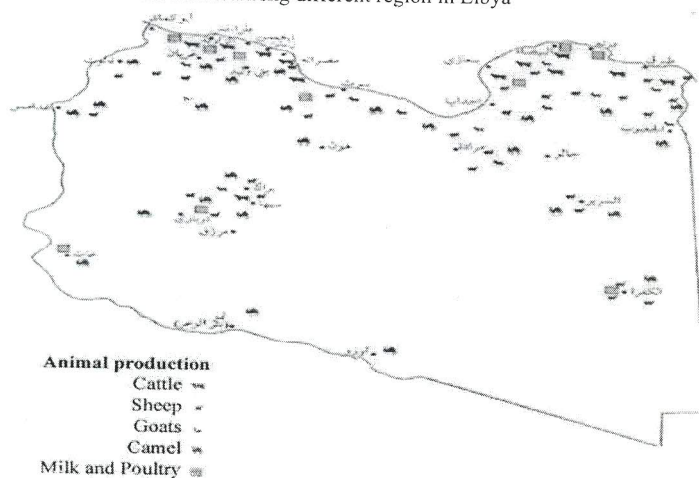
Table 3  
Contribution of sheep and goat meat relative to total red meat and total meat production.

| Item                                                       | Year   |        |        |
|------------------------------------------------------------|--------|--------|--------|
|                                                            | 1990   | 1995   | 2000   |
| Sheep-goat contribution from total red meat production (%) | 77     | 78     | 78     |
| Sheep-goat contribution from total meat production (%)     | 35     | 31     | 30     |
| Per capita (kg/year)                                       | 24.6   | 25.95  | 27.3   |
| Total requirement (Ton/year)                               | 101927 | 129984 | 163358 |
| Expected production (Ton/year)                             | 51650  | 65281  | 72929  |
| Deficiencies (%)                                           | 49     | 50     | 55     |

Table 4  
Recent report summarize meat production from goats and sheep ,cattle and camel during 1994-2004.

| Species                        | Meat production ('000 Ton)/year |      |      |      |
|--------------------------------|---------------------------------|------|------|------|
|                                | 94-98                           | 1999 | 2001 | 2004 |
| Sheep goat                     | 37                              | 66   | 66   | 59   |
| Cattle                         | 13                              | 12.5 | 12   | 12.3 |
| Camel                          | 5                               | 3.5  | 6    | 5.7  |
| Contribution of Sheep goat (%) | 67.3                            | 80.5 | 78.5 | 77   |

Map (1) Distribution of Livestock among different region in Libya



## Qualitative traits of Mahali goats

The general characteristics of Mahali goats:

|                      |                                                                                                                                                                                               |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1- body shape & size | Medium in size, mature female and male weighed 30-40kg and 40-50kg , the neck was nearly long, the back was straight ,tail very short, the body was covered by hair except the face and legs. |
| 2- Color             | Multi colored ; black, brown, red, white or pied.                                                                                                                                             |
| 3- Face              | Small and straight.                                                                                                                                                                           |
| 4- Horns             | Large in male extended in both side bended forward and back while it was short in female.                                                                                                     |
| 5- Ear               | Relatively long, pendulum to the face side and there is white spots on the ear if the animal color was black.                                                                                 |
| 6- Tail              | Short and bended to the back.                                                                                                                                                                 |
| 7- Beard             | Stable hair in the bottom of the jaw of male goat.                                                                                                                                            |

Picture (2) show different color of Mahali goat breed



Picture (5) Tebawi goats



Picture (3) Mahali goats



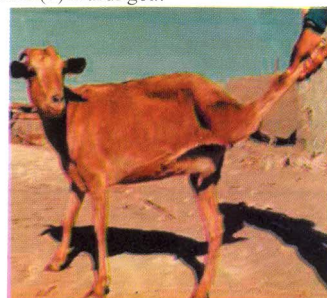
Picture (6) Targi goats



Picture (4) Mahali goats



Picture (7) Kurdi goat



### Quantitative traits of Mahali goats

Quantitative traits are those traits of economic importance for the breeder. Evaluation of these traits contribute in planning the future improvement of Mahali goats. Those traits could be divided into:

1- Reproductive traits: Mahali goats were considered as non-seasonal breeding, and mating takes place around the year.

2- Productive traits: Mahali goats are considered to be as dual purpose animal (meat & milk producer)

Table 5  
Reproductive traits of Mahali goats.

| Traits                    | Mahali goat | Source |
|---------------------------|-------------|--------|
| Puberty age of male (day) | 158 – 192   | (1)    |
| Estrus cycle length (day) | 17.3 ± .96  | (2)    |
| Estrus (hrs)              | 21.4 ± .94  | (2)    |
| Fertility ( %)            | 40 – 90     | (7)    |
| Lambing rate ( %)         | 90 – 130    | (7)    |
| Twining ( %)              | 10 - 40     | (7)    |

Table 6  
Shows the weight and growth:

| Traits                           | Mahali goat | Source |
|----------------------------------|-------------|--------|
| Birth weight (kg)                | 2.4         | (7)    |
| Weaning weight (kg)              | 9.9         | (7)    |
| Average weight at 3 – month (kg) | 9.3         | (7)    |
| Average weight at 7 – month (kg) | 16          | (7)    |
| Yearling weight (kg)             | 23.8        | (7)    |
| Daily gain, before weaning (g)   | 90          | (9)    |

Table 7  
Shows carcass traits:

| Traits                            | Mahali goat | Source |
|-----------------------------------|-------------|--------|
| Dressing (%)                      | 46 - 52     | (4)    |
| Reb eye muscle (cm <sup>2</sup> ) | 8 – 12      | (4)    |
| Meat (%)                          | 69.7        | (4)    |
| Bone (%)                          | 30.3        | (4)    |
| Humidity (%)                      | 76          | (4)    |
| Fat (%)                           | 2.2         | (4)    |
| Protein (%)                       | 20.8        | (4)    |
| Ash (%)                           | 1.1         | (4)    |

Table 8  
Shows milk yield:

| Traits                 | Mahali goat | Source |
|------------------------|-------------|--------|
| Lactation yield (kg)   | 79 – 132    | (8)    |
| Lactation length (wk)  | 22 – 32     | (8)    |
| Lactation yield (kg)   | 64          | (11)   |
| Lactation length (wk)  | 28          | (11)   |
| Lactation yield (kg):  |             | (11)   |
| before weaning(21 wks) | 53.3        |        |
| after weaning (7 wks)  | 10.8        |        |
| Fat (%)                | 2.3         | (11)   |
| Protein (%)            | 3.2         | (11)   |



## Improvement productivity of Mahali goats

• Several studies were conducted had shown that the productivity of local goats were lower compared to other breeds. The primary objectives of researchers were the improvements the productivity of Mahali goats trough:

### *I- characterization of Mahali goats by:*

1-studying and determining of the important reproductive traits that include; puberty age , estrus cycle length, estrus length, lambing interval and breeding time.

2-Milk yield, lactation length and milk composition.

3- Determine feed requirement for maintenance and production.

4- Studying the response to fattening.

5- Studying carcass traits.

### *II- Steps of genetic improvement:*

1- Establishing lines for meat production through selection for increasing growth rate.

2- Establishing lines for milk production through :  
✓ Selection within breed.

✓ Crossing Mahali goats by breed high in milk production.

Table 9

Weights and growth of four crossing groups

| Trait                          | Crossing group |            |           |           |
|--------------------------------|----------------|------------|-----------|-----------|
|                                | MM             | DD         | MD        | DM        |
| Birth weight (kg)              | 2.25±.05       | 3.31±.08   | 2.62±.07  | 2.83±.05  |
| Weaning weight (kg)            | 13.27±.78      | 21.58±1.37 | 15.25±.98 | 15.27±1.0 |
| Average. weight. 7- month (kg) | 16.79±1.5      | 29.85±2.1  | 28.04±2.1 | 24.25±1.6 |
| Yearling weight (kg)*          | 28.87          | 56.87      | 47.94     | 48.77     |
| Daily gain (g):<br>B. weaning  | 90±01          | 140±.01    | 94±.01    | 93±.01    |

\* Expected weight.

Table 10

Caracas traits of four crossing groups

| Trait                            | Crossing group |      |      |      |
|----------------------------------|----------------|------|------|------|
|                                  | MM             | DD   | MD   | DM   |
| Dressing (%)                     | 48.7           | 52   | 48.6 | 46.7 |
| Rib eye muscle(cm <sup>2</sup> ) | 13             | 21   | 21   | 21   |
| Meat (%)                         | 70.5           | 72.7 | 76.5 | 67.7 |
| Bone (%)                         | 25.1           | 24.5 | 26.4 | 28.8 |
| Humidity (%)*                    | 72.6           | 71.8 | 73.6 | 75.9 |
| Fat (%)*                         | 4.4            | 2.8  | 2.3  | 3.5  |
| Protein (%)*                     | 20.7           | 19.8 | 20.6 | 20.7 |
| Ash (%)*                         | 1.6            | 1.13 | 1.13 | 1.16 |

\* Biceps femurs muscle.

Table 11

Milk production and composition of four crossing groups .

| Trait                                          | Crossing group |            |           |           |
|------------------------------------------------|----------------|------------|-----------|-----------|
|                                                | MM             | DD         | MD        | DM        |
| Lactation yield (kg)                           | 64.1±9.2       | 83.24±16.5 | 93.86±7.3 | 68.16±7.1 |
| Lactation length (wk)                          | 28             | 28         | 28        | 28        |
| Lactation yield (kg):<br>before weaning(21 wk) | 53.3±6.6       | 72.25±14.3 | 77.34±4.7 | 58.10±5.0 |
| after weaning (7 wks)                          | 10.8±3.7       | 11.00±2.9  | 16.53±3.2 | 9.95±2.8  |
| Fat (%)                                        | 2.28±.5        | 3.51±.63   | 2.98±.57  | 2.78±.39  |
| Protein (%)                                    | 3.20±.2        | 3.22±.33   | 3.21±.26  | 3.42±.26  |

### Studies achieved:

- Characterization of the local goats was the primary goals that was achieved , in which they were showed previously.

- Crossing of Mahali goats x Maltase showed improvement of milk yield by 30% in crossbred among the Mahali.

- Crossing of Mahali x Damascus were conducted at Bir El-Ghanem station, the steps of the study were summarized in dividing the flocks during breeding season into four crossing groups included Mahali x Mahali (MM) , Damascus x Damascus (DD) , (MD) and (DM). The results obtained are summarized in the next tables.

### Conclusion of crossing Mahali x Damascus goats:

- The results obtained in tables (9,10 and 11) showed the superiority of Cyprus Damascus goats in all weights . The crosses groups MD and DM were superior over Mahali goats in different weight in which superiority ranged from 2 to 9 kg.

- The cross MD was superior to MM,DD and DM in total milk yield ,the same trend were obtained in pre-weaning and post-weaning milk yield. Milk fat % was found to be superior in DD over other crosses group; however protein % was superior in DM.

- Damascus goats was superior to Mahali goats in dressing% and rib eye muscle. The crosses MD have high meat% comparing with other pure breeds and cross breeds. The crosses MD and DM were both similar to Mahali goats in dressing%

### Recommendations:

- 1- Planned government strategy for drought relief will reduce the risk to goats and sheep producers and encourage increased production.

- 2- More research is needed on goats production systems, and an a wide range of social and economic issues for proper planning of the development of goats production system

- 3- Development of goats' meat and milk production could be achieved by applying a package of genetic improvement, feed supplying, health husbandry , management and marketing.

- 4- setting policy plans that will improve goats production through:

- Take care about local small producers and encourage their investment.

- Improve the water supply in the range which always obstacle to the development of animal production.

- Animal health and disease control

- Protection and development of the range land in addition to production of forages in the irrigated and rain fed areas.