

**LACTATION AND GROWTH TRAITS IN A CROSSING PROGRAM
BETWEEN AL-ARADI SAUDI AND DAMASCUS GOATS TO
DEVELOP NEW MILK AND MEAT LINES: RESULTS OF FIRST
GENERATION**

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ABSTRACT

This project aimed to; characterize genetically Al-Aradi goats, multiply rapidly elite bucks and does (Pure Aradi and synthetic lines adaptable to hot climate), disperse semen of genetically improved bucks and finally to establish frozen semen bank from the genetically improved bucks.

Towards these targets, crossing program between Al-Aradi goats (A) with Damascus goats (D) was started in 2006 in Al-Jouf Experimental Station and Al-Qassim University to develop two synthetic lines. For F1, 260 Aradi does were randomly divided into two groups (A1 and A2) and the breeding plan permitted to produce three genetic groups of A1A1, D1D1 and $\frac{1}{2}D1\frac{1}{2}A1$ in Jouf experiment plan and A2A2, D2D2, and $\frac{1}{2}D2\frac{1}{2}A2$ in Qassim experiment plan.

For F2, crossbred does of $\frac{1}{2}D1\frac{1}{2}A1$ or $\frac{1}{2}D2\frac{1}{2}A2$ will be backcrossed artificially from D1 or D2 bucks to produce $\frac{3}{4}D1\frac{1}{4}A1$ or $\frac{3}{4}D2\frac{1}{4}A2$. For F3, inter se mating for groups of $\frac{3}{4}D1\frac{1}{4}A1$ and $\frac{3}{4}D2\frac{1}{4}A2$ will be practiced and a group of $(\frac{3}{4}D1\frac{1}{4}A1)_2$ will be used as improved dairy line, while the group of $(\frac{3}{4}D2\frac{1}{4}A2)_2$ will be used as improved meat line.

In dairy synthetic line, selection will be practiced for milk production, while in meat synthetic line selection will be practiced for post-weaning growth. In the two lines, animals are being selected by a BLUP methodology under animal model, following the two criteria of selection.

Data of lactation and growth traits for 173 litters and 284 kids relevant to F1 were used to estimate heritabilities and permanent or common litter environmental effects using an animal model, while a generalized least square procedure was used to estimate direct additive genetic effects and direct heterosis.

Crossbred litters and lactations were positively significantly deviated from Aradi purebred in terms of litter traits and milk yield and components. Crossbred kids were heavier in most body weights and gains compared to purebred Aradi kids. Semen parameters in Damascus bucks of both experiments were significantly better than in Aradi ones for ejaculate volume, sperms concentration, percentages of motile sperms, abnormal sperms and dead sperms.

Heritability estimates were mostly moderate or low and ranged from 0.04 to 0.26 for litter traits, 0.13 to 0.37 for milk yield traits, 0.12 to 0.15 for fat in milk, 0.10 to 0.21 for solids not fat

in milk, 0.07 to 0.21 for protein in milk, 0.12 to 0.20 for lactose in milk, and 0.12 to 0.26 for ash in milk, 0.30 to 0.37 for body weights and 0.25 to 0.37 for gain in weight.

Estimates of direct additive for most litter, lactation, and growth traits were significant and moderate in favor of Damascus goats since the estimates ranged from 5.5 to 27.9 % for litter traits, 3.4 to 22.3 % for milk yield traits, 9.4 to 16.3 % for body weight traits and 3.8 to 26.9 % for gain in weight.

Most estimates of direct heterosis were moderate or high in crossbred litters, lactations and kids where the estimates ranged from 3.4 to 24.8 %.