

Evaluation of Cyprus and Local for milk yield and some its contents and relationship of breeding value with genetic markers

(BM320 , BM143)

Abstract

This study was carried out in the station for ruminant research of the State Board for Agriculture Research, Ministry of Agricultural in Abu Ghraib (23 km west of Baghdad) for the period of 1/10/2012 - 25/9/2013. The molecular genetics analysis were conducted in Laboratories of Biotechnology Researches Center ,Al-Nahrain University. The objective of the present study was to evaluate the Cyprus , Local goats and their cross for milk yield and milk composition through the study of the fixed factors and estimate the genetic parameters (heritability, repeatability, phenotypic and genetic correlation). The Best Linear Unbiased Prediction (BLUP) of for the traits were estimated. The study included 607 records of 163 goats for total milk yield, 303 records of 82 goats for pre-peak , peak , post-peak and 593 records for percentage of milk composition (fat, protein and lactose) of 119 goats.

The overall means for total milk yield through 179.54 days, pre-peak, peak, post-peak were 180.88 , 16.80, 18.18 and 165.16 kg , respectively, while the overall means for the percentage of fat, protein, lactose and daily milk yield were 2.98, 2.98, 4.44% , 0.358 kg , respectively. The heritabilities for total milk yield were 0.70 and 0.55 in Cyprus and the cross , respectively, and were 0.58 , 0.38 for lactation length in Cyprus and Local, respectively. While, heritabilities were 0.77, 0.72 , 0.09 for

percentage of fat,protein,lactose in Cyprus goats, respectively.The repeatabilities for total milk yield,lactation length, pre-peak,peak,post-peak were 0.74,0.64,0.78,0.85,0.72 in Cyprus goats, respectively, and were 0.95,0.99,0.96,0.95,0.78 in Local goats, respectively. While, the repeatabilities for total milk yield and laction length were 0.99 and 0.98 in the cross, respectively. Genetic correlations between milk yield traits were (- 0.18 – 0.88) (0.00 – 0.99) (0.17–1.00) in Cyprus,Local and the cross, respectively.Phenotypic correlations were (0.03 – 0.97) (- 0.32 – 0.99) (- 0.85 – 0.88) for same traits and genetic groups, respectively. In Cyprus goats, genetic correlations between milk yield and percentage of fat,protein and and lactose were - 0.10, 0.20, and - 0.08, respectively, and 0.25 between percentage of fat and protein. Phenotypic correlations between milk yield and fat,protein and lactose were 0.07,0.20 and 0.29, respectively, and between percentage of lactose, fat and protein were 0.27 and 0.49, respectively.The size of bands for BM302 and BM143 markers were detected and their relationship with milk yield and percentage fat and protein, as a tool for selection, were studied. The study included 161 records for milk yield and 219 records for percentage fat and protein of 66 Cyprus goats and 64 records for milk yield and 118 records for percentage fat and protein of 34 Local goats.Three alleles for BM302 in Cyprus goats (125,130,175 bp) and in Local goats (125,150,175 bp),while four alleles for BM143 in Cyprus goats (85,100,125,150 bp) and five alleles for local goats (85,100,125,150,175 bp) were found.

The marker BM302 had a highly significant effect on milk yield in Cyprus and local goats. The genotype 130/175 was high in milk yield (323.46 kg) in Cyprus goats and the genotype 150/150 was high in milk yield (221.50 kg) in local goats.The genotype 125/125 in Cyprus gave high milk yield (277.20kg),while the same genotype gave low milk yield (117.82 kg) in Local goats.Theallele 130 was

found in Cyprus goats and the allele 150 was found in Local goats. This indicates there was some genetic difference between Cyprus and Local. The genotype 130/130 was found in animals with negative BLUP and was not found in animals with positive BLUP, and gave a low milk yield (143.71 kg) in Cyprus goats. While, the genotype 125/125 was found in animals with negative BLUP in local goats and gave a low milk yield (117.82 kg) but was not found in animals with positive BLUP.

The marker BM143 had a highly significant effect on fat percentage and non significant for protein percentage in Cyprus goats, while had a highly significant effect ($p < 0.01$) on fat and protein percentage in Local goats. The results showed for genotype 100/150 a high fat percentage (3.63%) in Cyprus goats and (4.22%) in Local goats and a high protein percentage (3.18%) for genotype 125/125 in Local goats. The allele 175 was found in Local goats and was not found in Cyprus goats, this indicates a difference between two genetic groups for BM143 marker. The genotype 100/150 was found in Cyprus goats with positive BLUP and gave a high fat and protein percentage (3.63, 3.33 %), respectively. While, the genotype 85/85 with negative BLUP gave a low fat and protein percentage (3.63, 3.33 %), respectively. In Local goats the genotype 125/125 was found in animals with positive BLUP and gave a high fat and protein percentage (3.93, 3.18 %), respectively. While, the genotype 100/100 was found in animals with negative BLUP and gave a low fat and protein percentage (2.66, 2.89 %) , respectively.