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Genome-wide diversity and demographic history of Russian native goat breeds

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OBJECTIVES: We aimed to assess genome-wide diversity and to study demographic history of seven Russian native goat breeds based on SNP-data to prevent their irreparable loss.

MATERIALS AND METHODS: A total of 200 goats including Altai Mountain, Orenburg, Soviet Mohair, Dagestan Milk, Dagestan Local, Dagestan Fluff and Karachaev breeds were genotyped using Goat 50K SNP BeadChip (Illumina, USA). The calculations were performed in R package 'diveRsity' and *SneP.*

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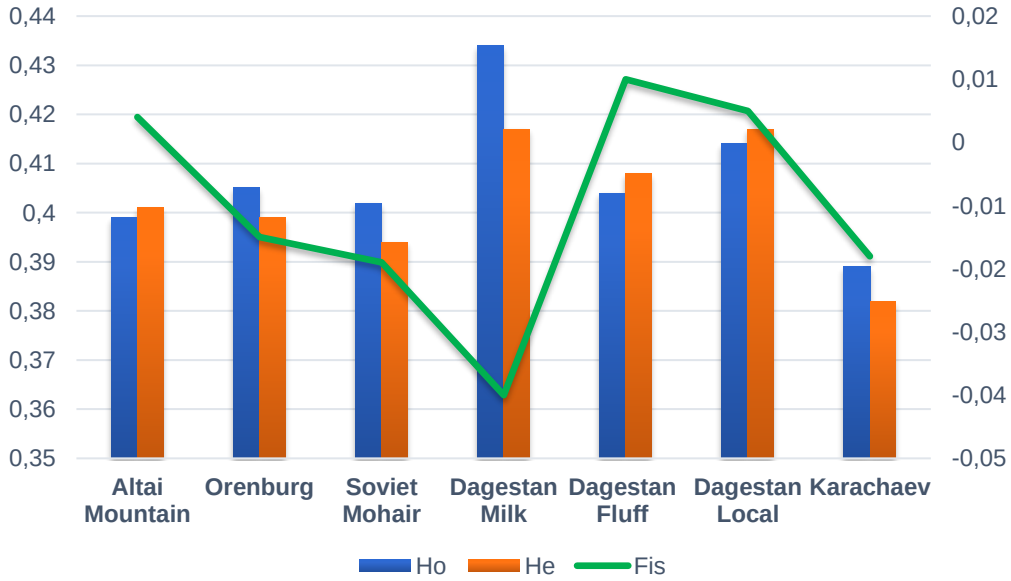
RESULTS (Fig.1): Observed heterozygosity (Ho) was high and exceeded 0.402 in five out of seven breeds. Orenburg, Soviet Mohair, Dagestan Milk, and Karachaev breeds showed slight excess of heterozygotes varied from 0.6% (Fis= -0.015) in Orenburg to 1.7% (Fis= -0.04) in Karachaev breed. The traces of insignificant inbreeding were found in Dagestan Local (Fis=0.005) and Dagestan Fluff (Fis= 0.01) breeds.

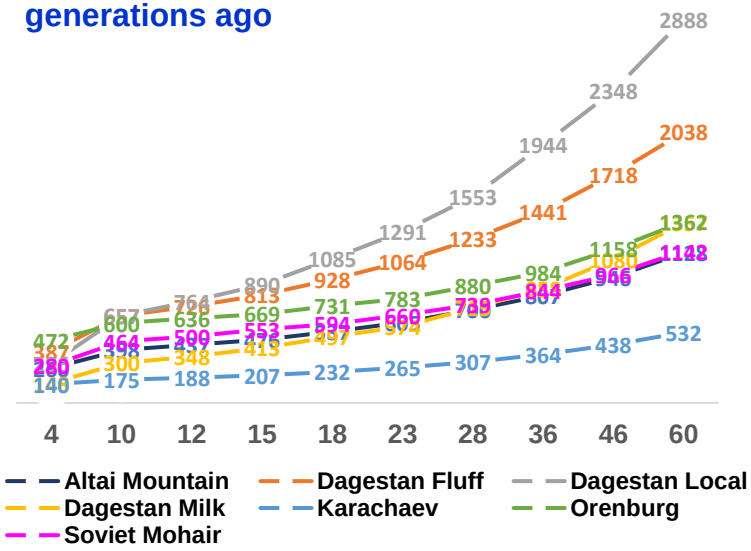
Fig 1. Genetic diversity indicators



CONCLUSION: Our findings provide an evidence that Russian native goat breeds are not in endangered status, but development of the effective utilization programs is highly recommended.

RESULTS (Fig.2): The recent effective population sizes estimated for 4 generations ago varied from 140 in Karachaev to 472 in Orenburg breed. Analysis of historical trends in effective population sizes estimated for 60 generations ago revealed obvious decrease ranging from 10.2% in Dagestan Local to 34.6% in Orenburg breed. However, recent effective sizes in Russian goats are higher than critical threshold (*Ne*= 100) that is essential to breed maintenance in the future.

Fig 2. Effective population sizes for 60 generations ago



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