

ABSTRACT

External udder shape, milkability, milk production and genetic variability were investigated in Istrian sheep, to evaluate the long-term perspective of the breed in milk production and the aptitude of Istrian sheep for machine milking. Heritabilities were estimated using single trait animal models. Generally, the heritabilities for daily milk yield, somatic cell score, fat, protein and lactose content were low. The udder shape heritabilities were 0.17, 0.15, 0.63, 0.50 for full udder height, maximum udder width, cisternal part below the teat orifice, and teat angle, respectively. The udder shape traits were influenced by number and stage of the lactation, and were more favorable in herds with applied machine milking. The milk flow traits' means were influenced by the stage of lactation. According to the estimated genetic parameters for udder shape traits, the cistern size is the most suitable target trait for selection that would benefit the proper machine milking. Based on the analysis of microsatellite markers, Istrian sheep is one of the three analysed breeds with the lowest observed heterozygosities (0.684), and with an inbreeding coefficient of intermediate value (0.061). When compared to neighbouring sheep breeds, it is one of the three most distinctive breeds with a large numbers of private alleles and relatively small level of introgression. In comparison with the Istrian sheep population from Slovenia, introgression is lower, inbreeding coefficient is smaller and diversity higher in Istrian sheep from Croatia. In summary, the results show that the external udder shape of the Istrian sheep is adequate for machine milking and that the breed has high variability in comparison to other sheep breeds.

Key words: genetic diversity; genetic parameters; genetic variability; milk content; sheep milkability