Effect of domestication processes on frequency of certain alleles and genotypes of ewes

Summary

The studies included breeds and crossbred ewes of different breeds and types: 196 mouflons, 773 Polish Heath ewes, 17 hybrids of mouflon and Polish Heath sheep, 188 Polish Mountain Sheep of coloured variety and 162 of white variety, 166 Swiniarka sheep and 331 Polish Merino ewes, i.e. 1833 animals in total. The evaluation of frequency of genes and genotypes responsible for health of the sheep, growth of body weight, traits of milking and coverage (hair), that is, gene of prione protein (*PRNP*), gene of insulin-like growth factor 1 (*IGF1*), gene of alfa-s1 casein (*CSN1S1*) and gene, coding brown hair (*TYRP1* – tyrosinase related protein 1), was carried out. There was revealed a high genetic differentiation between the examined animal groups in respect of gene of prione protein, gene of α-s1 casein and gene, coding the brown colour of hair (*TYRP1*) in contrary to gene of insulin-like growth factor 1 (*IGF1*) where the occurrence of only one allele was found in all groups of the studied ewes. In respect of gene of prione protein , the incidence of 2-6 alleles was recorded (when revealing the occurrence of 14 genotypes), the number of which increased from 2 in case of the European mouflon up to 6 in Polish Mountain Sheep of coloured variety and in Polish Merino sheep. On the other hand, in the case of gene of alfa-s1 casein, the sustainable frequency of the occurrence of alleles C and T in the European mouflon was found; it was reflected in sustainable distribution of genotypes, differently as in the remaining groups where allele T and genotype TT was decisively dominating in the frequency of occurrence in comparison to allele C and genotypes CC and TC. In turn, gene, coding the brown hair (*TYRP1*) revealed considerably higher frequency of occurrence of allele T vs. C in contrary to the remaining groups, from among which only in case of Polish Heath sheep the sustainable system of frequency of occurrence of the both alleles was recorded. The mentioned system was directly reflected in distribution of genotypes, excluding Polish Heath sheep and *świniarka* sheep where heterozygotic genotypes were dominating vs. homozygotic ones. The conducted studies allow to state that domestication processes had an influence on the quantity and distribution of alleles and genotypes in respect of gene of prione protein, gene of alfa-s1 casein and gene, coding the brown colour hair (*TYRP1)* in the contrary to gene of insulin-like growth factor 1 (*IGF1).*

KEY WORDS: sheep, frequency of alleles, frequency of genotypes, genes, origins