

Analysis of adaptation of Olkuska sheep to a new environment on the basis of the mineral composition of fodder

Summary

The aim of this study was to explain the differences in the prolificacy of Olkuska sheep flocks based on the mineral composition of fodder. A flock of Olkuska sheep from the county of Myszków (GPS:50.565460, 19.307009), with documented prolificacy of about 200%, brought to the Swojec Agricultural Experimental Station of the Wrocław University of Environmental and Life Sciences (GPS: 51.1157170, 17.1519120), showed a decrease in prolificacy to a level of 130-157%. The mineral composition of fodder was analysed using samples of meadow hay from three farms raising Olkuska sheep: (1) the Swojec Agricultural Experimental Station of the Wrocław University of Environmental and Life Sciences (used to feed the flock analysed), (2) the county of Myszków (where the breed originated) and (3) the Żelazna Agricultural Experimental Station of the Warsaw University of Life Sciences (source of male reproductive material; GPS: 51.867222, 20.136111). Additionally we analysed wool fibres of an Olkuska ram which were produced in part at the Żelazna station and in part at the Swojec station. The mineral composition of the hay and wool were determined by electron microscope analysis. Significant differences were found between the percentages of elements in the meadow hay from the three different environments ($P \leq 0.05$). The concentration of Na, Mg, Ca and Cu was 1.5-2 times higher in the meadow hay from the Żelazna station and Myszków Country than in the hay from the Swojec station. The hay from the Swojec station had higher (2-3-times) content of Cl and K and the lowest content of Cu. The effect of the nutritional environment was also seen in the content of elements in the wool fibres. The mineral content of the meadow hay – the main dietary component – may have contributed to the low prolificacy of the Olkuska sheep at the Swojec station due to the low level of Ca, P and Cu. Information on differences in the mineral composition of the soil, fodder and hair of livestock may serve as an indirect source of information on the problems of adaptation of animals to a new environment, and should not be overlooked in animal husbandry.

KEY WORDS: Olkuska sheep, environment, hay, wool, chemical elements