

Inbreeding depression and inbreeding load for litter size in Black Slavonian pig

Dubravko Škorput¹, Minja Zorc², Danijel Karolyi¹, Marija Špehar³, Zoran Luković¹

¹University of Zagreb Faculty of Agriculture, Svetošimunska cesta 25, Zagreb, Croatia (dskorput@agr.hr)

²University of Ljubljana, Biotechnological faculty, Jamnikarjeva 101, Ljubljana, Slovenia

³Croatian Agency for Agriculture and Food, Svetošimunska cesta 25, Zagreb, Croatia

Summary

Despite the relatively high number of individuals in the population of Black Slavonian pig, studies showed low genetic diversity in terms of absolute inbreeding coefficients and inbreeding rates. One of the known consequences of inbreeding is depression, which leads to a reduction in the phenotypic yield of fitness-related traits and other economically important traits. The genetic basis of inbreeding depression is the high degree of homozygosity in inbred individuals. This results in the presence of recessive allele pairs and the loss of the advantage of over-dominance at heterozygous loci. However, inbreeding depression in a population is highly variable and depends on the genotype of individuals that produce inbred individual. This variability can be attributed to a specific hidden individual inbreeding depression load. The aim of the study was to analyze the inbreeding depression for number of piglets born alive in 18470 litter records of 5642 sows and evaluate and predict the inbreeding loads for inbred individuals in the population. The pedigree contained 6199 triads. The total number of inbred animals was 1826. We used Mendelian decomposition of inbreeding and multivariate analysis with direct additive and inbreeding depression load effects. Small, but not significant effect of inbreeding on number of piglets born alive was found in Black Slavonian pig. However, mating plans should be created considering these results and the application of optimal contribution selection is an adequate tool to control inbreeding in the population.

Keywords: inbreeding depression, inbreeding load, litter size, Black Slavonian pig