

DEFINING SPECIFIC MICROSATELLITE ALLELES FOR MARKERS IN SELECTION OF LAYING HENS¹

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Use of chosen microsatellite sequences in genetic improvement of laying hen is the purpose of the project. The study involves two breeds of birds maintained in two environments (on floor and in cages): Rhode Island Red (RIR) – selected for egg production, and Green-legged Partridge chicken (GIP) – maintained as gene pool flock. Selection over three generations will select RIR birds divergently and GIP birds positively, for laying performance and egg quality. After routine performance recording of progeny in the first generation, breeding values were evaluated with the BLUP method employing animal model, and on this ground selection flocks were set up to produce the second generation. Five microsatellite sequences possibly linked to important egg quality traits were chosen: MCW0133, MCW0170, MCW0114, MCW0139 (PCR multiplex) and LEI0074, located in the chromosomes 7, 4, 4, 3 and in linkage group 26 (E46), respectively.

In the founder generation (generation 0) a total of 24 alleles was identified at the five microsatellite loci. The number of alleles ranged from four to six, with a mean of 4.8 per locus. Three alleles were identified as specific for the RIR, and six alleles for the GIP chicken. Breed specific alleles were found at each of the loci. The polymorphism of the studied sequences is correlated with three traits of egg quality: shell strength, egg weight and yolk weight.

Statistical analyses will aim at testing relationship between laying performance and polymorphism in birds maintained in different system which enables estimation of possible marker-environment interaction, and tracing changes of allele frequencies along with divergent selection for laying performance.

Keywords: chicken, microsatellites, marker genes, selection for egg laying performance

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