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E-mail: ruta@lva.lt

Relationship of GH, GHR and PRL genes polymorphisms with milk production traits in Lithuanian Black & White cows

R. Skinkyte[1], N. Peciulaitiene[1], S. Kerziene[1], L. Zwierzchowski[2], I. Miceikiene[1]
[1]K. Janusauskas Laboratory of Animal Genetics, Lithuanian Veterinary Academy, Tilzes 18, LT – 47181 Kaunas, Lithuania, [2]Polish Academy of Sciences Institute of Genetics and Animal Breeding, Jastrzebiec, 05-552 Wolka Kosowska, Poland.

Genes coding for growth hormone receptor (GHR), growth hormone (GH) and prolactin (PRL) are considered as candidates for genetic markers of productive traits in farm animals. The purpose of this study was to estimate associations of milk production traits between five different polymorphic sites within GHR, GH and PRL genes of LBW cattle, using PCR-RFLP method.

Polymorphic sites and allele frequencies of GHR, GH and PRL genes of LBW cattle are shown in the table →

Locus, polymorphic site	*Position of mutation*	*Allele frequency*
GHR-AccI	*5'-noncoding region -887, C/T*	*(+) 0.61 (-) 0.39*
GHR-AluI	*5'-noncoding region -1177, A/T; -1104, C/T*	*(+) 0.50 (-) 0.50*
GHR-Fnu4HI		*(+) 0.87 (-) 0.13*
GH-AluI	*exon 5, 2241, C/G*	*(L) 0.63 (V) 0.37*
PRLP-RsaI	*exon 3, 103, A/G*	*(A) 0.81 (B) 0.19*

ANOVA general linear model (MINITAB 14, 2005) was used to estimate associations between different polymorphic sites and production traits. Significant associations are shown in the table ↓

Loci	*Milk composition traits*	*Effect*
$GHR^{(AluI+/+)}$	*fat %*	*+0.63%**
$GHR^{(AluI+/-)}$	*fat %*	*+0.55%***
$GHR^{(AluI+/+)}$	*protein yield*	*-47.65 **
$GHR^{(AluI+/-)}$	*protein yield*	*-30.92**
$GHR^{(AccI+/+)}$	*fat %*	*+0.84 %**
$GHR^{(AccI+/-)}$	*fat %*	*+1.05 %****
$GHR^{(AccI+/-)}$	*milk yield*	*75.67 **
PRL^{AA}	*fat %*	*-0.58 %**
GH^{LV}	*fat %*	*+0.51 %***

Conclusion:
Identified genotypes, having relationship to milk production traits can be used as selection criteria for Lithuanian black & white cattle population improvement.