

中国荷斯坦牛 *POU1F1* 基因与 *PRL* 基因的多态性及其聚合效应对产奶性状的影响

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摘要 文章采用DNA测序、PCR-RFLP和CRS-PCR技术对979头中国荷斯坦牛 *POU1F1* 基因与 *PRL* 基因进行研究, 发现了3个新SNPs, 分别是 *POU1F1* 基因第二外显子G1178C、*PRL* 基因5'侧翼区A906G和A1134G。采用SAS统计软件GLM程序, 利用最小二乘法拟合线性模型, 分析基因多态性与产奶性状的关系。结果表明: *POU1F1* 基因1178位点GC基因型在产奶量、乳蛋白量、乳脂量方面均为优良基因型。*PRL* 基因5'侧翼区906位点AG基因型在产奶量方面为优良基因型, 1134位点不同基因型产奶性状差异不显著。对 *PRL* 基因5'侧翼区的906位点和 *POU1F1* 基因的1178位点进行基因互作分析, 结果在乳脂率、乳蛋白率、产奶量、乳蛋白量和乳脂量方面各基因型组合之间均未观察到显著差异, 说明基因聚合效应并不是单基因效应的简单相加, 基因聚合效应在分子育种中具有重要的意义。

关键词: 中国荷斯坦牛 *POU1F1* 基因 *PRL* 基因 多态性 产奶性状 基因聚合效应

Abstract: Three novel SNPs were found by DNA sequencing, PCR-RFLP and CRS-PCR methods were used for genotyping in 979 Chinese Holstein cattle. One SNP, G1178C, was identified in exon 2 of *POU1F1* gene. Two novel SNPs, A906G and A1134G, were identified in 5' -flanking regulatory region (5' -UTR) of *PRL* gene. The association between poly-morphisms of the two genes and milk performance traits were analyzed with PROC GLM of SAS. The results showed that GC genotype at 1178 locus of *POU1F1* gene was advantageous for milk yield, milk protein yield, and milk fat yield. AG genotype at 906 locus was advantageous for milk yield. There was no significant difference between 1134 locus and milk performance traits of 5' -UTR of *PRL* gene. Analysis of genotype combination effect on milk production traits showed that the effect of combined genotype was not simple sum of single genotypes and the effects of gene pyramiding seemed to be more important in molecular breeding.
Keywords: Chinese Holstein cattle, *POU1F1*, *PRL*, polymorphism, milk performance traits, combined effects

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