

生物技术 生命科学

牛HSF1和HSBP1基因多态性分析

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摘要:

利用DNA测序技术对牛HSF1和HSBP1进行SNPs位点扫描,共发现4个新SNPs,包括HSF1 1451(G/T)位点、HSBP1第二内含子324(G/C)、589(C/T)和651(C/G)位点。利用CRS-PCR和PCR-RFLP技术对867头荷斯坦牛、85头鲁西黄牛和28头渤海黑牛进行基因多态性分析。 $\chi^2$ 检验表明,HSF1 1451(G/T)位点和HSBP1 589(C/T)位点在荷斯坦牛和鲁西黄牛群体中已达到Hardy-Weinberg平衡状态( $P>0.05$ ),而HSBP1 324(G/C)和651(C/G)位点的突变在荷斯坦牛群中均未达到Hardy-Weinberg平衡状态( $P<0.05$ )。HSF1 1451位点(G/T)AA基因型频率最高,优势等位基因为A,而HSBP1 3个SNPs频率最高的基因型分别为AB、AA和BB,589(C/T)位点的优势等位基因为A,而324(G/C)和651(C/G)位点均为B。HSBP1 651(C/G)位点不同基因型的分布在三个牛品种中存在差异,在荷斯坦牛中AA型频率最低,而在鲁西黄牛和渤海黑牛中AA型频率最高,推测该基因型与耐热性有关。该结果将为奶牛耐热分子育种提供理论参考。

关键词: 牛;SNPs;HSF1;HSBP1;CRS-PCR;PCR-RFLP

Polymorphisms Analysis of HSF1 and HSBP1 in Cattle

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Abstract:

DNA sequencing was used for SNPs scanning in HSF1 and HSBP1 in 3 cattle breed. Four novel SNPs were discovered, including 1451(G/T)in HSF1, 324(G/C), 589(C/T) and 651(C/G) in HSBP1. CRS-PCR and PCR-RFLP method were used for polymorphism analysis in 867 Holstein cattle, 85 Luxi Yellow cattle and 28 Bohai Black cattle.  $\chi^2$  test indicated that 1451(G/T) site in HSF1 and 589(C/T) site in HSBP1 reached Hardy-Weinberg equilibrium in Holstein and Luxi cattle( $P>0.05$ ), while 324 (G/C) and 651 (C/G) sites in HSBP1 were not met Hardy-Weinberg equilibrium in Holstein( $P<0.05$ ). The frequency of AA genotype was the highest. A allele was the dominant allele in HSF1 in experimental population. When it came to HSBP1, AB, AA and BB appear more frequently, dominant allele at 589 (C/T) was A, and that at 324(G/C) and 651(C/G) was B. The distributions of different genotypes at 651 (C/G) locus of HSBP1 in 3 breed were different. The frequency of AA genotype was the lowest in Holstein, but that was the highest in Luxi cattle and Bohai Black cattle. So it was presumed that AA genotype was related to thermo tolerance. This result will provide theoretical reference for thermo molecular breeding in dairy cattle.

Keywords: cattle SNPs HSF1 HSBP1 CRS-PCR PCR-RFLP

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