

研究论文

Leptin基因的PCR-SSCP与牛体重、体尺指标的相关性

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摘要

利用PCR-SSCP技术研究了南阳牛、秦川牛、郟县红牛、西镇牛、鲁西牛和荷斯坦奶牛6个牛品种539个个体leptin基因的遗传多态性。结果表明, PCR扩增产物大小为330 bp, PCR-SSCP分析表现出多态。南阳牛、秦川牛、郟县红牛、西镇牛、鲁西牛和荷斯坦奶牛的A等位基因频率分别为0.558, 0.492, 0.571, 0.658, 0.591, 0.615; B等位基因频率分别为0.442, 0.508, 0.429, 0.342, 0.409, 0.385。不同基因型与体重、体尺等生长性状指标相关性分析的结果表明: 南阳牛群体内除12月龄的体高和日增重、18月龄的坐骨端宽和日增重外, BB型个体的六月龄、十二月龄、十八月龄、二十四月龄体斜长、胸围、体重、坐骨端宽、体高和日增重均显著的大于AB和AA型个体 ($P < 0.05$); 秦川牛群体内BB基因型个体十字部高上显著高于群体AA、AB型个体 ($P < 0.05$), 即BB>AA、AB, 可作为秦川牛体尺指标(十字部高)候选基因之一, 但在体重、胸围、体长指标上均无显著差异 ($P > 0.05$), 所以不宜作为体重、胸围、体长指标候选基因; 郟县红牛群体内AB与BB基因型个体在十字部高和坐骨端宽上显著高于群体AA型个体 ($P < 0.05$), 而群体内不同基因型在体重和体尺指标(体高、体斜长、胸围)上无显著差异 ($P > 0.05$)。序列分析表明, leptin基因多态是第66位发生G→T、第67位发生A→C及299位发生新的单核苷酸突变C→T所造成。

关键词 [牛; leptin; PCR-SSCP; 多态性; 生长发育性状](#)

分类号

Association of Polymorphisms of Leptin Gene with Body Weight and Body Sizes Indexes in Chinese Indigenous Cattle

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Abstract

PCR-SSCP was used to analyze the polymorphism of leptin gene in 539 samples of six cattle breeds, namely Nanyang (NY), Qinchuan (QC), Jiaxianred (JXR), Xizhen (XZ), Luxi (LX), and Holstein cow (HOL) breeds. PCR products with a 330 bp were amplified and sequenced. The results showed that the frequencies of alleles A/B of NY, QC, JXR, XZ, LX, and HOL breeds were 0.558/0.442, 0.492/0.508, 0.571/0.429, 0.658/0.342, 0.591/0.409, and 0.615/0.385, respectively. The association of variations of leptin gene with growth traits in NY, QC, JXR breeds was analyzed. Some indexes of the individuals with genotype BB were higher than that with genotype AA and AB in NY breed, such as the indexes of body length, heart length, body weight, hucklebone width, body height, and average day gain. The height at hip cross of the individuals with genotype BB was higher than that of those with genotype AA and AB in QC breed ($P < 0.05$). So leptin gene may be one of the candidate genes for growth traits with height at hip cross, but not for body weight, heart length, and body length trait. However, the height at hip cross and hucklebone width of the individuals with genotype AB and BB were higher than that of those with genotype AA in JXR breed ($P < 0.05$), but the difference was not

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statistically significant in body weight and body sizes (body height, body length, and heart length). And the polymorphisms in leptin gene were caused by G→T transversion at the 66th bp position, A→C transversion at the 67th bp position and G→T transversion at the 299th bp position. These results may be applied to marker-assisted selection of Chinese cattle breeds. </P>

Key words [Chinese indigenous cattle](#) [leptin gene](#) [PCR-SSCP](#) [polymorphism](#) [growth traits](#)

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