

研究报告

## *FSH $\beta$* 基因PCR-SSCP多态性及其与济宁青山羊高繁殖力关系的研究

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收稿日期 2006-1-20 修回日期 2006-3-10 网络版发布日期 2006-9-5 接受日期

### 摘要

采用PCR-SSCP技术检测促卵泡素 $\beta$ 亚基(follicle-stimulating hormone  $\beta$ , *FSH $\beta$* )基因5' 调控区、外显子1和外显子2在高繁殖力山羊品种(济宁青山羊)和低繁殖力山羊品种(辽宁绒山羊、波尔山羊、安哥拉山羊)中的单核苷酸多态性, 同时研究该基因对济宁青山羊高繁殖力的影响。结果表明: 山羊与绵羊的*FSH $\beta$*  基因该段核苷酸序列同源性为98%。9对引物中, 只有P9的扩增片段存在多态性。P9的扩增片段在济宁青山羊和辽宁绒山羊中检测到AA、AB和AC 3种基因型; 在波尔山羊中检测到AA、CC和AC 3种基因型; 在安哥拉山羊中检测到AA、BB、CC、AB、AC和BC共6种基因型。测序分析发现BB型与AA型相比在外显子2的第94 bp处有G→A突变, 并引起氨基酸改变(丙氨酸→苏氨酸); CC型与AA型相比在外显子2的第174 bp有一处C→T沉默突变。济宁青山羊AA、AB和AC基因型频率分别为0.686、0.137和0.177。AA基因型济宁青山羊产羔数最小二乘均值比AB基因型的多0.78只( $P<0.05$ ), 比AC基因型的多0.64只( $P<0.05$ )。

关键词 [山羊](#) [高繁殖力](#) [促卵泡素 \$\beta\$ 亚基基因](#) [PCR-SSCP](#)

分类号 [S827.2](#)

## PCR-SSCP Polymorphism of *FSH $\beta$* Gene and Its Relationship with Prolificacy of Jining Grey Goats

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### Abstract

<P>The follicle-stimulating hormone beta-subunit (<EM>FSH $\beta$ </EM>) gene was studied as a candidate gene for the prolificacy in Jining Grey goats. According to the sequence of ovine *FSH $\beta$*  gene, nine pairs of primers were designed to detect single nucleotide polymorphisms of 5' regulatory region, exon 1 and exon 2 of <EM>FSH $\beta$ </EM> gene in both high fecundity breed (Jining Grey goat) and low fecundity breeds (Liaoning Cashmere goat, Boer goat and Angora goat) by PCR-SSCP. The results indicated that the homology of nucleotide sequence of this fragment between goat and sheep was 98 percent. Only the products amplified by primer P9 displayed polymorphism. Three genotypes (<EM>AA</EM>, <EM>AB</EM> and <EM>AC</EM>) were detected in Jining Grey goats and Liaoning Cashmere goats. Three genotypes (<EM>AA</EM>, <EM>CC</EM> and <EM>AC</EM>) were detected in Boer goats. Six genotypes (<EM>AA</EM>, <EM>BB</EM>, <EM>CC</EM>, <EM>AB</EM>, <EM>AC</EM> and <EM>BC</EM>) were detected in Angora goats. Sequencing revealed a G→A mutation at 94 bp of exon 2 of <EM>FSH $\beta$ </EM> gene in the <EM>BB</EM> genotype in comparison to the AA genotype and a C→T mutation at 174 bp of exon 2 of <EM>FSH $\beta$ </EM> gene in the <EM>CC</EM> genotype in comparison to the AA genotype. The former mutation resulted in an amino acid change: alanine→threonine, and the latter mutation did not cause any amino acid change. Genotype frequency of <EM>AA</EM>, <EM>AB</EM> and <EM>AC</EM> was 0.686, 0.137 and 0.177 in Jining Grey goats, respectively. The does with genotype <EM>AA</EM> had 0.78 (<EM>P</EM><0.05) or 0.64 (<EM>P</EM><0.05) kids more than those with genotype AB or AC in Jining Grey goats, respectively.</P>

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**Key words** [goat](#) [prolificacy](#) [follicle-stimulating hormone beta-subunit gene](#) [PCR-SSCP](#)

DOI:

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