



动物营养学报

CHINESE JOURNAL OF ANIMAL NUTRITION

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动物营养学报 2012, Vol. 24 Issue (10) :2036-2043 DOI: 10.3969/j.issn.1006-267x.2012.10.025

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饲料NFC/NDF对奶山羊瘤胃上皮细胞胰岛素样生长因子 I 及其受体的基因表达的影响

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Dietary NFC/NDF Affects Expressions of *IGF- I* and *IGF- I R* Genes in the Ruminal Epithelium of Dairy Goats

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摘要 本试验旨在探讨饲料不同非纤维性碳水化合物和中性洗涤纤维比(NFC/NDF)条件下,诱导奶山羊发生亚急性瘤胃酸中毒(SARA)过程中瘤胃上皮细胞胰岛素样生长因子 I (*IGF- I*)及胰岛素样生长因子 I 受体(*IGF- I R*)的基因表达量的变化。选用12只泌乳期中奶山羊为试验动物,试验分4期进行,每期15d,依次饲喂NFC/NDF分别为1.02(I期)、1.24(II期)、1.63(III期)、2.58(IV期)的4种饲料,以逐渐增加饲料精料的方式诱导奶山羊发生SARA,并采用实时定量PCR(qRT-PCR)法对瘤胃上皮细胞中*IGF- I*及*IGF- I R*的基因表达量的变化进行相对定量分析。结果表明:随着饲料NFC/NDF的升高,*IGF- I*及*IGF- I R*的基因表达量均出现不同程度的增加,II期、III期和IV期*IGF- I*的基因表达量分别是I期的1.70、2.71和9.61倍,*IGF- I R*的基因表达量分别是I期的1.88、3.09和10.19倍。饲料NFC/NDF为2.58(即SARA期)时,与I期相比,*IGF- I*和*IGF- I R*的基因表达量均出现极显著增加($P<0.01$)。结果提示,以提高饲料NFC/NDF的方法逐渐诱导SARA,*IGF- I*及*IGF- I R*的基因表达量显著提高,SARA发生后,它们的表达量有大幅增加。

关键词: 亚急性瘤胃酸中毒 瘤胃上皮细胞 实时定量PCR 胰岛素样生长因子 I 胰岛素样生长因子 I 受体

Abstract: The objective of this study was to investigate the changes of expressions of insulin-like growth factor I (*IGF- I*) and insulin-like growth factor I receptor (*IGF- I R*) genes in the ruminal epithelium of dairy goats in the process of inducing subacute rumen acidosis (SARA) under the condition of different dietary ratios of non-fiber carbohydrate and neutral detergent fiber (NFC/NDF). This study was designed for four experimental periods with twelve lactating *Guanzhong* dairy goats, and 15 days in each period. Goats were fed 4 diets with different NFC/NDF (1.02, 1.24, 1.63 and 2.58, respectively). The induction of SARA was conducted by the gradual increase of dietary NFC/NDF, and expressions of *IGF- I* and *IGF- I R* genes were quantitatively analyzed by quantitative real-time PCR (qRT-PCR). The results showed as follows: expressions of *IGF- I* and *IGF- I R* genes were both increased with the gradual increase of dietary NFC/NDF. The expression of *IGF- I* gene in periods II, III and IV was 1.70, 2.71 and 9.61 times of that in period I, respectively, and the expression of *IGF- I R* gene in periods II, III and IV was 1.88, 3.09 and 10.19 times of that in period I, respectively. Compared with period I, expressions of *IGF- I* and *IGF- I R* genes significantly were increased when NFC/NDF reached 2.58 ($P<0.01$). In conclusion, induction of SARA using the method of increasing dietary NFC/NDF can significantly increase expressions of *IGF- I* and *IGF- I R* genes, and they are increased sharply after SARA occurs.

Keywords: subacute rumen acidosis, ruminal epithelium, quantitative real-time PCR, insulin-like growth factor I, insulin-like growth factor I receptor

收稿日期: 2012-04-12;

基金资助:

国家自然科学基金项目(30960252);现代农业产业技术体系建设专项资金资助

引用本文:

周向丽, 刘大程, 孙鸽等. 饲料NFC/NDF对奶山羊瘤胃上皮细胞胰岛素样生长因子 I 及其受体的基因表达的影响[J]. 动物营养学报, 2012, V24(10): 2036-2043

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