



# 动物营养学报

CHINESE JOURNAL OF ANIMAL NUTRITION

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动物营养学报 2013, Vol. 25 Issue (5) :996-1003 DOI: 10.3969/j.issn.1006-267x.2013.05.014

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## 饲料NFC/NDF对奶山羊甲烷和二氧化碳排放量的影响

马燕芬<sup>1</sup>, 杨淑青<sup>2</sup>, 薛瑞婷<sup>2</sup>, 胡红莲<sup>1</sup>, 杜瑞平<sup>1</sup>, 牛文艺<sup>1</sup>, 高民<sup>1</sup>

1. 内蒙古农牧业科学院动物营养研究所, 呼和浩特 010031;

2. 内蒙古农业大学动物科学学院, 呼和浩特 010018

## Effects of Dietary Ratio of Non-Fiber Carbohydrates to Neutral Detergent Fiber on Emissions of Methane and Carbon Dioxide in Dairy Goats

MA Yanfen<sup>1</sup>, YANG Shuqing<sup>2</sup>, XUE Ruiting<sup>2</sup>, HU Honglian<sup>1</sup>, DU Ruiping<sup>1</sup>, NIU Wenyi<sup>1</sup>, GAO Min<sup>1</sup>

1. Animal Nutrition Institute, Inner Mongolia Academy of Agriculture & Animal Husbandry Sciences, Huhhot 010031, China;

2. College of Animal Science, Inner Mongolia Agriculture University, Huhhot 010018, China

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**摘要** 本试验旨在研究饲料非纤维性碳水化合物和中性洗涤剂纤维比(NFC/NDF)对奶山羊甲烷(CH<sub>4</sub>)和二氧化碳(CO<sub>2</sub>)排放量的影响。选择体重、泌乳期、胎次和产奶量相近且健康无疾病的9头泌乳后期奶山羊,随机分为3组,每组3只羊,分别饲喂饲料NFC/NDF为1.02、1.24、2.58的3种试验饲料,采用Sable呼吸测量系统实时测定24 h内CH<sub>4</sub>和CO<sub>2</sub>排放量。结果表明:1)Sable呼吸测量系统可代替气相色谱对CH<sub>4</sub>等气体排放量进行测定,可以实时监测CH<sub>4</sub>和CO<sub>2</sub>排放量的变化,能更为准确地反映舍饲反刍动物温室气体排放的变化特征。2)CH<sub>4</sub>日排放量随奶山羊干物质采食量的增加而升高,随饲料NFC/NDF增加而降低;CO<sub>2</sub>日排放量随饲料NFC/NDF增加而升高。3)不同饲料NFC/NDF条件下奶山羊在早、晚采食后3~4 h内出现排放峰值,在22:00之后,CH<sub>4</sub>排放量则保持在一个较低的浓度直至次日开始下一次采食。结果提示,饲料NFC/NDF对奶山羊CH<sub>4</sub>和CO<sub>2</sub>排放量有显著影响。

**关键词:** NFC/NDF 奶山羊 甲烷 二氧化碳 Sable呼吸测量系统

**Abstract:** The effects of dietary ratio of non-fiber carbohydrates to neutral detergent fiber (NFC/NDF) on methane and carbon dioxide emissions in dairy goats were studied in this trial. Nine healthy late-lactating dairy goats with similar body weight, lactation stage, parity and milk yield were randomly divided into 3 groups with 3 goats in each group, which were fed experimental diets with 1.02, 1.24 and 2.58 NFC/NDF, respectively. Methane and carbon dioxide emissions were measured using Sable respiratory measurement system. The results showed as follows: 1) the current gas chromatogram was substituted by Sable respiration measurement system which could be adapted to monitor concentrations of methane and carbon dioxide at real time, even show the more exactly releasing characteristic of methane and carbon dioxide about ruminant from indoor-fed livestock. 2) Methane daily emission was increased with the increase of dry matter intake, but was decreased with the increase of dietary NFC/NDF; carbon dioxide daily emission was increased with the increase of dietary NFC/NDF. 3) Methane emission showed a peak after 3 to 4 hours of feeding under different NFC/NDF, after 22:00, methane emission remained a relatively low concentration until the next feeding in the next day. In conclusion, dietary NFC/NDF significantly affects the emissions of methane and carbon dioxide in dairy goats.

**Keywords:** NFC/NDF, dairy goats, methane, carbon dioxide, Sable respiratory measurement system

收稿日期: 2012-11-22;

基金资助:

现代农业产业技术体系建设专项资金资助; 内蒙古农牧业科学院青年创新基金(2012QNJJM01)

通讯作者 高民, 研究员, 硕士生导师, E-mail: gmyh1588@yahoo.com.cn

引用本文:

马燕芬, 杨淑青, 薛瑞婷等. 饲料NFC/NDF对奶山羊甲烷和二氧化碳排放量的影响[J]. 动物营养学报, 2013, V25(5): 996-1003

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