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Xuefeng Guo

*Inner Mongolia Agriculture University, China*

Huawei Li

*Inner Mongolia Agriculture University, China*

Hai Jin

*Inner Mongolia Academy of Animal Science, China*

Dexun Lu

*Inner Mongolian Academy of Animal Sciences, China*

Osamu Enishi

*National Institute of Livestock and Grassland Science, Japan*

*See next page for additional authors*

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**Presenter Information**

Xuefeng Guo, Huawei Li, Hai Jin, Dexun Lu, Osamu Enishi, and Mitsunori Kurihara

## Methane emissions from Inner Mongolian Cashmere goats at different dietary nutrient levels

Guo Xuefeng<sup>1</sup>, Li Huawei<sup>1</sup>, Jin Hai<sup>2</sup>, Lu Dexun<sup>2</sup>, Osamu Enishi<sup>3</sup>, Mitsunori Kurihara<sup>3</sup>

<sup>1</sup>College of Animal Science and Animal Medicine, Inner Mongolia Agriculture University, Huhhot 010018, P.R. China E-mail: guoxuefeng807@163.com. <sup>2</sup>Inner Mongolia Academy of Animal Science, Huhhot 010030, P.R. China. <sup>3</sup>National Institute of Livestock and Grassland Science, Tsukuba, Ibaraki 305-0901, Japan

**Key words** maintenance level, Ad libitum, Inner Mongolian Cashmere goat, Methane, SF<sub>6</sub> tracer technique(SF<sub>6</sub>)

**Introduction** Inner Mongolian is a dominating breeding base of Cashmere goats in China. According to the statistics yearbook, the population of total Cashmere goats was 28.087 million and 38% of the goats are in Inner Mongolia(2005), which exist on desert grassland with poor biogeocoenosis, where the Ash, crude fiber and lignin contents of pastures is higher than that of other grassland, so the special breed of Cashmere goat was acclimated. Inner Mongolian Cashmere was named the best inartificial fiber and economic value is considerable. So the numbers of Cashmere goats were increasing year by year, but the methane emission of Cashmere goats was still evaluated by models in China and the data of in vivo had not been reported by now. So the objective of this study was to measure methane emission of Cashmere goats on maintenance level and at ad libitum intake using SF<sub>6</sub> tracer gas technique, in order to obtain methane emission exactly to provided datum for programming methane emission list and feasible Mitigation Strategies.

**Materials and method** 8 Cashmere goats were 1.5 years old and weighed 30±1 kg(mean SEM). The experiment was designed as a randomized complete block with two treatments, i.e. on maintenance level and at ad libitum intake, with four goats in each block individually. The experiment consisted of a 21-d pre-experiment stage and a 15-d experiment stage; The diets consisted of 20% Alfalfa +80% Chinese Leymus and Licking brick (containing minerals, and vitamins), the residual pastures of ad libitum should be more than 15% of total dry matter intake. The diet was offered twice daily at 5:30 am and 5:30 pm respectively and free to water. Quantities of feed offered and refusals were recorded daily for each animal and Samples of diets and refusals were retained weekly for determination of DM content. Methane emission was measured by SF<sub>6</sub> trace technique according to Kristen Johnson (1994). The concentration of methane was determined by Gas Chromatography(GC-9A), Det(FID), 200°C; Inj, 120°C; Col, 65°C; Standard, 20.36 ppm; the sample (0.02ml) was injected onto the GC column via a dead volume gas Micro liter Syringe. The concentration of SF<sub>6</sub> was determined by Gas Chromatography(GC-2014), Det(ECD), 300°C; Inj, 100°C; Col, 60°C; Standard, 97.00ppt; the sample (1ml) was injected onto the GC column via a dead volume gas Micro liter Syringe.

**Results** Methane emission of Cashmere goats at different dietary nutrient levels showed in table 1, Daily CH<sub>4</sub> emissions per animal was fed Alfalfa /Chinese Leymus pastures were greater at ad libitum intake than on maintenance level (P<0.05), but methane emission expressed every kilogram DMI is not significant different (P>0.05) and MCR is higher on maintenance level than at ad libitum intake(P<0.05).

**Table 1** Methane emission of Cashmere goats at different dietary nutrient levels.

Item	Maintenance level	Ad libitum	Significant
DMI, kg/d	0.581±0.107	0.839±0.088	P<0.05
g/(goat·d)	10.43±1.67	15.07±2.62	P<0.05
g/kg of DMI	18.06±1.44	17.71±1.48	NS
MCR, %	8.98±0.42	6.28±0.17	P<0.05

**Conclusions** Methane emission of Cashmere goats increased with increasing of DMI; when Cashmere goats were fed Alfalfa / Chinese Leymus pastures, the methane emission was 10.43g/d (maintenance level) and 15.07g/d (ad libitum), which were indexes of methane emission list for Cashmere goat in China.

### Reference

Johnson, K.A., Huyler, M.T., Westberg, H.H., et al. (1994). Measurement of methane emission from ruminant livestock using SF<sub>6</sub> tracer technique. *Environment Sci. & Technol* 28:359.