

Effect of different feeding methods on fatty acids composition in muscle of Nanjiang Yellow Goat

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Key words : Nanjiang Yellow Goat kids feeding method fatty acids

Introduction Nanjiang Yellow Goat is a new and unique goat bred for mutton through selected-breeding for 40 years in China. It is well known for its high mutton quality. The feeding methods could affect mutton quality, including mutton taste (Arsenos et al., 2002). This study was aimed to investigate the effect of different feeding methods on fatty acids composition in muscle of Nanjiang Yellow Goat.

Materials and methods Nanjiang Yellow Goat Stud is in a semi-tropical climate region at the altitude of 1300-2000 m in Nanjiang county, Sichuan province, China. It is cold and humid in early spring, hot and short in summer and cold and long in winter. The annual averaged temperature, precipitation, relative humidity and evaporation are 16.2°C, 1199 mm, 72% and 1391 mm, respectively.

In this study, 32 two-month old weaning Nanjiang Yellow Goat healthy male kids with similar body weight (BW) were selected and randomly divided into two groups as control (grazing all day) and the treatment (grazing with supplement feeding). Three goat kids from each group were slaughtered to collect longissimus muscle samples at 2, 4 and 6 months for the fatty acid composition measurement. The data were subjected to one-way analysis of variance using GLM procedure in SAS (1989).

Results and discussion The fatty acid composition of longissimus muscle and gluteus of Nanjiang Yellow Goat kids was shown in Table 1. The content of Saturated Fatty Acids (SFA) has decisive influence on nutrition value of the mutton (Callow, 1958). Higher SFA could induce the amount of human blood cholesterol increasing (Grundy et al., 1982). In this study, the contents of SFA increased gradually as the age increases. However, compared with the control, the content of SFA was lower at 4 and 6 months. The results implied that the content of SFA in muscle was reduced by grazing with supplement feeding. The short-chain fatty acids (SCFA) are the metabolism production of the rumen microbe fermenting forage grass. The contents of SCFA between the two groups at the same age were not significantly difference.

Table 1 Fatty acid composition of longissimus muscle and gluteus of Nanjiang Yellow Goat kids.

Muscle	Item	2-month old		4-month old		6-month old	
		Treatment	Control	Treatment	Control	Treatment	Control
Longissimus muscle	SFA	47.74±3.35	47.18±3.79	44.60±2.02	48.99±5.23	46.86±1.93	53.65±7.66
	SCFA (C6-C12)	0.28±0.07 ^b	0.36±0.07 ^b	0.30±0.01 ^b	0.36±0.04 ^b	1.12±0.41 ^{ab}	1.92±1.38 ^a
Gluteus	SFA	49.94±3.26 ^a	43.39±4.15 ^b	54.49±4.3 ^a	55.40±1.10 ^a	56.19±3.07 ^a	58.03±4.3 ^a
	SCFA (C6-C12)	0.32±0.01 ^b	0.33±0.01 ^b	0.36±0.11 ^b	0.45±0.08 ^b	2.37±0.94 ^a	2.24±0.75 ^a

Means with different upper case letters within the same row differ $P < 0.01$. Means with different lower case letters within the same row differ at $P < 0.05$.

Conclusion Grazing with supplement feeding can increase the content of Unsaturated Fatty Acids (UFA) in Nanjiang Yellow Goat kids muscle, decrease the content of short-chain fatty acids.

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