

**Table S1. PCR primer sequences of the target genes**

Genes	Primer sequence (5'-3')	Product size/bp	Tm/°C
<i>IL-1<math>\beta</math></i>	F: CAGCCGTGCAGTCAGTAA	100	57
	R: TGTGAGAGGAGGTGGAGAG		
<i>IL-6</i>	F: GGGTAAAGAACGCAAAGGT	136	55
	R: TGACCAGAGGAGGGAATG		
<i>IL-10</i>	F: GGCCTGTGTCATCGTTTCTG	91	60
	R: ACACCCCTCTCTTGAGCAT		
<i>IFN-<math>\gamma</math></i>	F: CAGGAGCTACCGATTCAAC	100	56
	R: AAACCCAAAAGCACACAGA		
<i>TNF-<math>\alpha</math></i>	F: ACACCATGAGCACAAAAGC	103	60
	R: AGGCACCAGCAACTTCTGGA		
<i>Claudin-1</i>	F: GTGGATGTCGTGCGTGTC	127	58
	R: TAGTCCCAGCAGGATGCC		
<i>Occludin</i>	F: AGCAGCAGTGGTAACTGG	111	58
	R: TCCCGTCGTGTAGTCTGTT		
<i>ZO-1</i>	F: CGAGCAGACGCAGAAAA	123	55
	R: GGCAGAAGATTGTGGTTGA		
<i><math>\beta</math>-actin</i>	F: CATCGTCCACCGCAAT	103	56
	R: GCCATGCCAATCTCATCTC		

**Table S2. Antibody types and dilution ratios**

primary antibodies	dilution ratio	company
Claudin-1	1:1000	Shanghai Beyotime Biotechnology Co.
Occludin	1:1000	Proteintech Group, Inc
Zo-1	1:1000	Proteintech Group, Inc
p65	1:500	Shanghai Beyotime Biotechnology Co.
P-p65	1:300	Beijing Boao Sen Biotechnology Co.
IKB- $\alpha$	1:800	Shanghai Beyotime Biotechnology Co.
P- IKB- $\alpha$	1:500	Beijing Boao Sen Biotechnology Co.
P38	1:1000	Shanghai Beyotime Biotechnology Co.

P-p38	1:1000	Shanghai Beyotime Biotechnology Co.
JNK	1:500	Shanghai Beyotime Biotechnology Co.
P-JNK	1:500	Beijing Boao Sen Biotechnology Co.
ERK	1:200	Proteintech Group, Inc
P-ERK	1:200	Affinity Biosciences
β-actin	1:1000	Shanghai Beyotime Biotechnology Co.
secondary antibodies		
IRDye 800CW	1:10000	Li-Cor Inc
IRDye 680RD	1:15000	Li-Cor Inc

Table S3 Effects of different soluble carbohydrate-to-neutral detergent fiber ratios in the diet on rumen epithelial morphology of lambs

Item	Diets			SEM	P-value	P <sub>linear</sub>	P <sub>quadratic</sub>
	L group	M group	H group				
papillae width	157.04	148.48	158.46	2.35	0.177	0.802	0.066
papillae height	899.96 <sup>b</sup>	1336.60 <sup>a</sup>	1358.37 <sup>a</sup>	37.84	<0.001	<0.001	<0.001
papillae area	148791.09 <sup>b</sup>	202029.32 <sup>a</sup>	218595.19 <sup>a</sup>	7261.64	<0.001	<0.001	0.170

Data were expressed as mean ± SEM. In the same row, values with different letter superscripts mean significant difference (p < 0.05). L group = SCHO-to-NDF ratio was 1.0; M group = SCHO-to-NDF ratio was 1.5; H group = SCHO-to-NDF ratio was 2.0.