

Table S1. PCR protocols.

Gene	Primers	Primer sequences 5'-3'	PCR cycles	Amplicon length (bp)	Reference for primers
mcrA -1	mcrA-F	GGTGGTGTMGGATTACACARTAYGCWACAGC	3 min/95 °C;	488	[40]
	mcrA-R	TTCATTGCRTAGTTWGGRTAGTT	30 x (1 min/94 °C, 1 min/52 °C, 1 min/72 °C); 10 min/72 °C		
mcrA - 2	ME1-F	GCMATGCARATHGGWATGTC	5 min/95 °C;	280	[41]
	MCR1-R	ARCCADATYTGRTCRTA	35 x (1 min/94 °C, 45 s/59 °C, 1 min/72 °C); 10 min/72 °C		
16S rRNA Archaea	Ar109-F	ACKGCTCAGTAACACGT	2 min/95 °C;	806	[42]
	Ar915-R	GTGCTCCCCCGCCAATTCCT	20 x (1 min/94 °C, 1 min/62** °C, 1 min/72 °C); 10 x (1 min/94 °C, 1 min/52 °C, 1 min/72 °C); 10 min/72 °C		
16S rRNA methanogens	MG0357F-gc MG0691R	(GC clamp*)CCCTACGGGGCGCAGCAG GGATTACARGATTTAC	3 min/94 °C; 35 x (30 s/94 °C, 30 s/53 °C, 1 min 30 s/72 °C); 5 min/72 °C	334	[43]

*GC clamp (CGCCCGCCGCGCGCGGGCGGGGCGGGGCGGGGGCACGGGGGG)

** Touchdown cycling with decrease of 0.5 °C in each cycle