

## The nature of diet impacts the composition of epimural bacterial and archeal communities in the rumen of dairy goats

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In the reticulo-rumen, the microbiota associated with epithelial papillae is the least documented while its beneficial role for stabilizing the rumen ecosystem and animal health may be critical. Its core composition and causes of compositional variation were reviewed only recently. In order to assess in rumen-cannulated dairy goats how diet affected the epithelial microbiota composition, we sampled the rumen and epithelial microbiota of 12 dry animals fed a forage (F) diet and 12 lactating animals fed a concentrate (C) diet. The procedure comprised the temporary emptying and two-fold rinsing of rumen and scrubbing two swabs on the roof and lateral surface of the dorsal rumen. Following DNA extraction, the 16S rRNA genes hypervariable region V4-V5 was amplified. Using Illumina MiSeq platform and FROGS pipeline, 2033746 sequences were clustered into 1929 OTUs assigned using 138 SILVA 16S database. By comparing rumen and epithelial data, a subset of 572 epithelium-specific OTUs was analysed. The dominant phyla were Bacteroidota (relative abundances of 30% and 27% in F and C), Firmicutes (47% in F vs 28% in C,  $P=0.002$ ) and Proteobacteria (12% in F vs 40% in C,  $P=0.001$ ) followed by Fibrobacterota (2.5% in F vs 0.4% in C,  $P=0.005$ ) and Actinobacteriota (2.1% in F vs 0.7% in C,  $P=0.0001$ ). In epithelial microbiota of F goats, higher Archaea abundance (2.8% mostly *Methanobacteriaceae* vs 1.4% mostly *Methanomethylophilaceae*,  $P=0.009$ ) was measured as well as higher alpha-diversity indexes. Principle coordinates analysis (PCoA, Figure 1) revealed clear clustering of epithelial communities by diet along the principal coordinate axis 1, which may stem from how the production kinetics of soluble metabolites of rumen and/or host origin shaped these communities, directly or through ecological interactions.

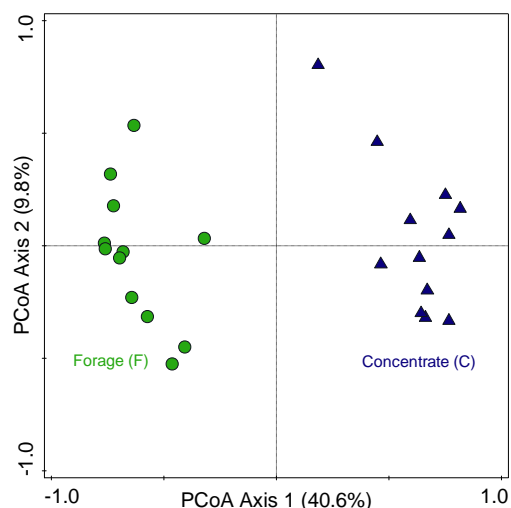


Figure 1 Beta diversity of rumen epithelial microbial communities of goats fed Forage or Concentrate diet revealed by PCoA based on Bray-Curtis distances