212 Shifting cattle from grazing extensive pastures to floodplain pastures in the Northern Territory: Effect on rumen microbial communities

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Introduction

The majority of beef cattle production in northern Australia is extensively grazed on unimproved pastures and aged cows are often preferentially culled from breeding herds, as they are at increased risk of mortality. The sale of these surplus to breeding requirement cows (culled cows) is often an important contributor to the overall revenue generated by the beef enterprise. Aged cows are often low in body condition at the time of culling and relocating them to the higher-quality floodplain pastures to increase liveweight and improve carcase characteristics has been identified as having the potential to increase profits.

Methods

The effect of relocating cows that have been grazing low-quality native pastures to higher quality floodplain pastures on the rumen microbiome was investigated in 41 cows sourced from either commercial (COM) properties (32 cows) or Beatrice Hill Research Station (BHRS) (9 cows). Rumen fluid samples obtained from animals at induction to the floodplain (day 0), and again 34 and 137 days after grazing the flood plain were used for microbial diversity profiling (barcoded V3-V4 16S rRNA gene amplicon) using the Illumina MiSeq sequencing platform.

Results

Rumen microbial diversity changed significantly during the trial, with cows sourced from COM properties having lower microbial diversity than the BHRS cows, when first introduced to the floodplain. After 34 days of co-grazing on the floodplain pastures, the microbial diversity measures had increased for the COM cows and were not significantly different to the BHRS cows. Following a further 103 days of grazing floodplain pastures, the extent of microbial diversity and overall rumen microbial community composition had converged.

Discussion/Conclusions

The convergence of microbial populations indicated the transfer of rumen microbes between co-grazing, mature cows. The study also indicated that diet is one of the primary drivers in determining the relative taxonomic composition of the rumen, even in a relatively uncontrolled, extensively grazed feeding system, such as the floodplain pastures of the Northern Territory.

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