

DOMESTICATED EQUINES DIFFER IN THEIR FAECAL MICROBIOME COMPOSITION

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Comparative studies aiming to identify differences in the fibrolytic potential of the hindgut microbiome between different types of equines are lacking, particularly as donkeys are known to degrade fibre more effectively than horses and ponies. A study was therefore conducted to assess differences in faecal microbiome composition of ponies, donkeys and donkey × pony hybrids that were all fed a haylage and straw based diet. Faecal samples were collected from eight healthy animals per equine type, and quantitative PCR was used to determine faecal concentrations of bacteria, archaea and anaerobic fungi. Universal 16S rRNA gene barcoded amplicon sequencing was used to characterise the faecal bacterial/archaeal community composition. Faecal concentrations of bacteria, archaea and anaerobic fungi were not affected by equine type ($P > 0.05$). Using weighted UniFrac based analysis of the 16S rRNA sequence data, it was found that the bacterial/archaeal community composition of donkeys differed from that of ponies ($P = 0.01$). However, hybrids did not significantly differ from either donkeys or ponies ($P > 0.05$). At the genus level, two taxa were affected by equine type, namely *Lachnoclostridium* 10 ($P = 0.033$) and *Lachnospiraceae* probable genus 10 ($P = 0.012$), both of which are known to contain species/isolates with cellulolytic activity. The relative abundance of both taxa was significantly higher in donkeys compared to both ponies and hybrids ($P < 0.0036$), with no significant difference between ponies and hybrids ($P > 0.05$). In conclusion, the faecal microbiome of ponies was different to donkeys only in terms of bacterial/archaeal community composition, with the hybrids being intermediate of the two parent types. Based on the higher relative abundance of two bacterial genera in donkeys, relative to ponies and hybrids, it is speculated that these genera may contribute to the ability of donkeys to degrade fibre more effectively compared to other domesticated equines.