

## Evaluation of the use of animal compounds as substrates by felid fecal microbiota: a cheetah model

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Although strict carnivores like felids do not consume plant fibre, considerable intestinal fermentation has been measured. This indicates that certain animal-derived compounds can serve as substrates for fermentation and microbial proliferation in the feline hindgut. It is often claimed that enzymatically indigested animal material exerts the production of toxic compounds in the hindgut, but to date, only little peer-reviewed documentation is available, whereas in contrast, recent findings point to specific microorganisms in the feline hindgut that use proteolysis products as a substrate.

The present study investigated to which extent faecal microbiota of the cheetah (as model for strict carnivores) ferment animal tissues and which would be the concomitant end product profile.

Fresh faecal samples of captive cheetahs were collected and processed into an inoculum, combined with following substrates: casein (pure protein), bone, skin, hair, cartilage, collagen, chondroitin-glucosamine mixture, glucosamine, fructo-oligosaccharides (FOS, positive control), cellulose (negative control). During 72 hours, cumulative gas production was continuously registered. Thereafter, incubates were sampled for analysis of volatile fatty acids (VFA).

Gas production was highest for FOS, followed by glucosamine, chondroitin-glucosamine mixture and cartilage. Casein gave intermediate gas production, but still more than collagen. Bone, skin, hair and cellulose were poor fermentation substrates. Interestingly, maximum gas production rate of FOS occurred much later compared to all animal substrates.

VFA production was highest with FOS. Glucosamine and glucosamine-chondroitin showed high VFA production, whereas cartilage and casein produced moderate VFA. Despite the low gas production, collagen had high short-chain fatty acids production and showed, in contrast to all other substrates, a very high ratio of acetic to propionic acid.

The present data indicate that cartilage and cartilage related compounds are well-fermentable animal tissue for faecal microbiota of the cheetah. Moreover, collagen can also contribute to microbial fermentation, but behaves differently and needs to be look at thoroughly.