

Behaviour

Not only ruminants: indications for differences in digestive physiology between grazing and browsing large hindgut fermenters

CLAUSS M, HUMMEL J

Institute of Animal Physiology, Physiological Chemistry and Animal Nutrition,
Schönleutnerstr. 8, D-85764 Oberschleissheim, Germany;
clauss@tiph.vetmed.uni-muenchen.de

In ruminants, browsing species do not achieve the same apparent digestibility (aD) coefficients as grazing species (IASON and VAN WIEREN 1999), which can be explained by the tendency of browsers to have shorter mean retention times (MRT) for particles (CLAUSS and LECHNER-DOLL 2001). The ultimate cause of this difference is the fact that browse material is fermented faster than grass; for browsers, longer MRTs would not make sense. In theory, similar digestive differences would be expected in other herbivore taxa as well, although the paucity of species measured until now might not allow statistical testing.

Among the large hindgut fermenters, African elephants (*Loxodonta africana*) are known to include a higher proportion of browse in their natural diet than Asian elephants (*Elephas maximus*) (CERLING et al. 1999); while horses (*Equus przewalskii* f. *caballus*) and white and Indian rhinoceroses (*Ceratotherium simum*, *Rhinoceros unicornis*) are grazers, black and Sumatran rhinoceroses (*Diceros bicornis*, *Dicerorhinus sumatrensis*) are exclusive browsers (OWEN-SMITH 1988).

Data collections on the MRT in horses and rhinoceroses show that the browsing black rhinoceros seems to have a comparatively shorter MRT for its body weight. The African elephant has a shorter MRT than the Asian elephant. In data collections that compare the dietary cell wall (NDF) content and the achieved aD for organic matter (OM, for rhinos) or dry matter (DM, for elephants), it seems obvious that the browsing species do not achieve the same aD coefficients as the grazing species.

These observations indicate that the digestive differences demonstrated and postulated in ruminants may apply to other taxa of herbivores as well.

CERLING et al. (1999): *Oecologia* **120**,364-374.

CLAUSS, LECHNER-DOLL (2001): *Oecologia* **129**, 321-327.

IASON, VAN WIEREN (1999): In: *Herbivores, plants and predators*, (eds): OLFF H, BROWN VK, DRENT RH, Blackwell, Oxford, UK, 337-369.

OWEN-SMITH (1988): *Megaherbivores: the influence of very large body size on ecology*. Cambridge University Press, Cambridge, UK.