Response of Draught Animals to Restricted Access to Grazing in Sub-Saharan Africa

Knowledge of feed intakes by draught cattle and donkeys with restricted access to grazing or feeds is expected to make a valuable contribution to the development of sustainable strategies for improving the performance of livestock in semi-arid areas of sub-Saharan Africa. The interacting effects of restricted feeding time, quality of the diet and availability of forage on feed intake by cattle and donkeys were investigated, and the foraging strategies of cattle and donkeys were compared.

Feeding behaviour studies used portable electronic devices for collecting intake data from grazing cattle and donkeys.

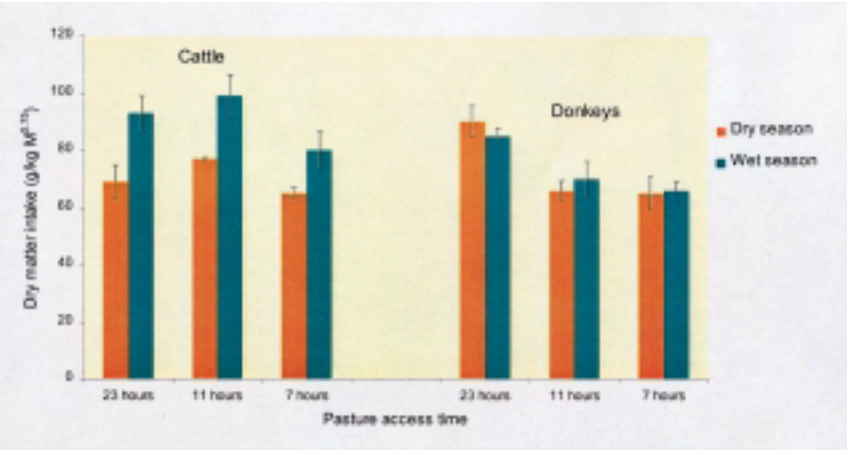
Background

One of the main constraints to improved crop production in resource-poor crop/livestock farmers is the lack of sufficient feed resources to sustain work levels required from draught animals. This problem is often exacerbated where access to feed is restricted – because the animal is working for part of the day, is tethered to prevent crop damage or is kept in a kraal during the night to prevent theft or attack from wild animals. Under-nutrition may result in decreased work output, with consequent effects on crop yields and area cultivated.

Research highlights

The project measured feed intakes by draught cattle and donkeys with restricted access to grazing or feeds, and observed any behavioural strategies used by animals to cope with reduced grazing time. The potential for feasible alternatives to traditional, restrictive feeding practices that improve animal productivity and welfare without impairing daily work output were explored.

In trials in Ethiopia and Zimbabwe, restricted feeding time had no significant effect on the feed intake of cattle. To compensate for restricted access, cattle spent more time grazing per hour, took more bites and more bites per step. As grazing time became restricted, donkeys ate less and also selected a poorer quality diet.



Restricted feeding time had no significant effect on the intake of cattle grazing rangeland in Zimbabwe. For donkeys, intake decreased when time was reduced from 23 to 11 hours per day. ($M^{0.75}$ = metabolic weight)

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Project completed in 1996

When given the opportunity, donkeys used the hours of darkness to feed, whereas cattle did not graze at night. It is recommended therefore that, during periods of work, donkeys be permitted to graze at night in order to achieve a satisfactory intake. Alternatively, a concentrate supplement might be fed. This option is however considered unlikely to be adopted as smallholders are more likely to feed high quality concentrates to other classes of livestock.

Uptake

The effect of time of access to pasture on intake in two classes of stock – cattle and donkeys – under most pasture conditions has been established. Project findings indicate that donkeys require extra time for grazing or, alternatively, supplementary feeding during the working period. Adoption of either strategy would need farmers to modify current production practices and objectives. Night grazing of donkeys may also result in greater predation and incidence of theft. Supplementary feeding is unlikely to be targeted at the donkey when it could be used to feed a multi-purpose animal such as a cow. However, on farms where the donkey may be the only class of large animal present, options to improve feeding practices may actually be more feasible than on wealthier farms with a larger and more varied stock of draught animals.

Linkages

The Livestock Production Programme (LPP) has funded other projects on draught animal power which include research on the donkey – projects R5198: Keeping draught animals fit for work and R5926: Appropriate tillage implements for donkeys – beasts of burden for the poor are larger projects with a range of research activities. Another project is on their use and management by poor societies in peri-urban areas of Ethiopia (R7350). This present project makes a valuable contribution by stressing nutritional constraints peculiar to draught animals. Intake may not necessarily be constrained by absolute availability of feed but the period of access to it. Furthermore, the project recognises that more effort is required in understanding the nutritional requirements and feeding behaviour of the donkey. An investigation of the effects of forage availability, forage quality and sward structure on the intake of donkeys grazing tropical rangelands is specifically recommended.

Relevance to sustainable livelihoods

Promotion of technical interventions related to the donkey is likely to have limited livelihood impact in farming households where this animal has low priority amongst others with greater functionality and, hence, value. However, on poorer farms (typically female-headed households) where the donkey may be the most valuable asset and certainly the only source of transport and power for planting and tillage, it may be afforded more care. The LPP continues to prioritise research into the productivity and welfare of draught animals that have particular importance to the poor, namely donkeys and indigenous breeds of cattle.

Selected project publications

- Smith, D.G. (1997) Effect of feed quality and time of access to feed on feeding behaviour and nutrient intake of tropical cattle and donkeys. PhD Thesis. University of Edinburgh.

- Smith, D.G., Mayes, R.W. and Raats, J. (in press) Alkane profiles of 41 species of common tropical grass. *Australian Journal of Agricultural Research*.

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This Project Summary is an output from the Livestock Production Programme funded by the United Kingdom's Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID.

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