A Practical Dairy Feed Rationing System for Smallholder Milk Producers in the Tropics

A quantitative feed rationing system – the key to optimising productive outputs of animals and to making efficient use of feed resources in livestock production systems – has been developed for use in the tropics. A computer package for dairy cattle feed rationing, called DRASTIC, was produced and tested on smallholder farms in Tanzania and Bolivia.

Background

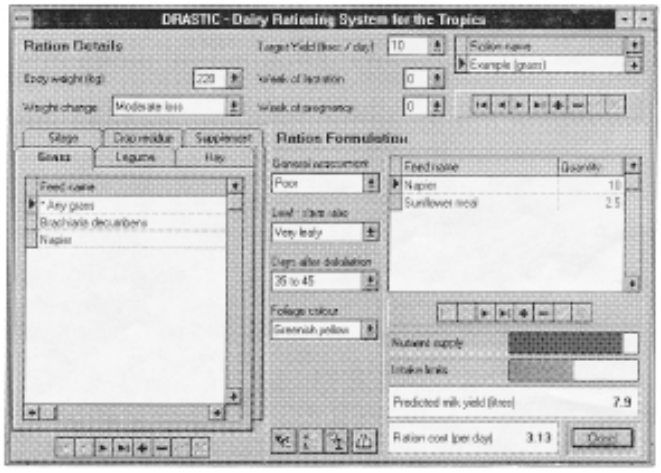
Small-scale dairy production is increasingly making a contribution to the sustainable livelihoods of smallholders in developing countries. Hired labourers from poorer households benefit from payments in kind (milk) as well as increased opportunities for earning cash. A key constraint to the further development of smallholder dairy production is a lack of access to reliable information on appropriate livestock feeding strategies. Also, the capacity of extension services to support the planning of effective feeding and management strategies for smallholder dairy cattle is limited. Existing extension literature is not readily accessible to extension staff when they need expertise in animal nutrition, and does not help farmers cope with the complex and dynamic decision-making that is needed for effective management.

Using DRASTIC assists a smallholder dairy producer in the Beni Department, Bolivia, to calculate optimum feed rations for milk production.

Research highlights

The project produced a user-friendly computer software package for dairy cattle feed rationing called DRASTIC (dairy rationing system for the tropics). The program can be used by local and regional headquarters of extension services, in offices of technical support staff in dairy co-operatives and through dairy development projects. It allows extension and technical staff to provide effective decision support (i.e. correct feeding advice) to smallholder farmers, based on the actual quality of feeds available to the farmers.

Statistical analysis of data collected on 49 smallholder dairy farms in Tanga Region, Tanzania, to test DRASTIC indicated that in 95 per cent of cases an error of less than one litre per day was detected from the predicted yield. In on-farm testing of DRASTIC software in Bolivia, using input data provided by 10 local farmers from the Santa Cruz Department on their current milk yields and ration compositions, a high level of accuracy was also demonstrated.



The user interface. DRASTIC is a user-friendly software package that stimulates farmers to plan feeding strategies.

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Uptake

DRASTIC was enthusiastically received by extension workers due to its ease of use, and several small producers in Bolivia requested copies to try out for themselves. Using DRASTIC, extensionists and farmers can plan feeding strategies in response to the real management questions that arise from the dynamic nature of dairy production in the tropics. A smallholder farmer in the Beni Department of Bolivia, well-known locally for his resistance to invest in his farm, took immediate steps to implement the new feeding regimes – developed using DRASTIC during a visit to his farm – by purchasing the feed supplements recommended by the program.

As a direct result of the dissemination workshops held in Bolivia, DRASTIC has been the subject of first degree/ undergraduate theses of two students at the University of Trinidad, Beni Department. Their results demonstrated good correlation between predicted and actual milk yields in supplemented and non-supplemented grazing conditions on smallholder dairy farms in the region. At a workshop, organised with the local farmers' association to explain the results and to demonstrate its advantages, DRASTIC was well recieved by the target beneficiaries.

Linkages

A detailed collection of feed use and performance data was established in Bolivia in collaboration with the DFID bilateral-funded Dairy Cattle Nutrition Project in Santa Cruz. These data were supplemented with similar data-sets collected by other DFID-commissioned projects: Livestock Production Programme (LPP) projects R5690 in Nepal, R6359 in Tanzania and R6775 in Kenya. Mailshots of a publicity leaflet to 50 researchers in developing countries have resulted so far in the despatch of around 30 copies of the evaluation/prototype version of DRASTIC.

Highly successful dissemination workshops have also taken place in India. State milk co-operatives in Gujarat and Rajasthan are considering adopting a modified version of DRASTIC for use by their extension advisory services. In response to encouragement from the Bolivian National Milk Producers Association (FEDEPLE), funding will be sought for dissemination workshops for the other milk producing departments of Bolivia. Funding will also be sought for other projects to generate lasting developmental impact of DRASTIC.

The development of an extension methodology and training pack, for promoting the use of DRASTIC in association with extension/farmer groups in East Africa, has been proposed. The Livestock Production Programme Project R7431 'Talking Pictures', based on a version of the software modified to produce a dynamic illustrated extension guide, is aimed for use by smallholder milk producers. Development of a closely related integrated system for planning the feeding of draught animals is also underway (R7376 'Oxfeed'). Wider dissemination of DRASTIC globally, including the distribution and modification of the software and the establishment and maintenance of a DRASTIC Internet site over a three-year period, has been recommended. The DRASTIC software and manual are available in both English and Spanish language versions.

Relevance to sustainable livelihoods

Sustainable livelihoods of resource-poor milk producers will benefit from the decision support provided to extension workers and technical staff by DRASTIC. It will be particularly valuable when planning strategies to optimise feed resources during the changing conditions throughout the year. This will result in wider access to cheaper dairy products for poorer consumers in rural and urban areas and will increase the income of resource-poor milk producers.

Selected project publications

- Thorne, P.J., Sinclair, F.L. and Walker, D.H. (1997) Using local knowledge of the feeding value of tree fodder to predict outcomes of different supplementation strategies. *Agroforestry Forum*, **8** (2): 45–49.

- Thorne, P.J. and Herrero, M. (1998) The role of livestock in natural resources management. pp. 87–94. In: *Food, Lands and Livelihoods: Setting Research Agendas for Animal Science. Proceedings of an International Conference, KARI Conference Centre, Nairobi, Kenya, 27–30 January 1998.* BSAS Occasional Publication no. 21. British Society of Animal Science, Edinburgh, UK.

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