Too many mouths to feed: a new tool to allocate feed efficiently

RIU

Validated RNRRS Output.

The OXFEED decision-support tool is now available to help farmers get the most from the feed they have available. The tool takes into account the fact that draft animals have to be given a minimum amount of food to allow them to do the work required of them as efficiently as possible. But, overfeeding them wastes resources that could be used to feed other livestock or for mulching and green manuring. OXFEED can base its 'conclusions' for feed allocation on local data—which means that recommendations will be relevant to specific farmers in a specific area. And, it's simple to use. However, the tool is not widely known, and its current usage is mainly limited to Bolivia.

Project Ref: **LPP10:**
Topic: **2. Better Lives for Livestock Keepers: Improved Livestock & Fodder**
Lead Organisation: **Stirling Thorne Associates, UK**
Source: **Livestock Production Programme**

Document Contents:

Description

LPP10

Research into Use
NR International
Park House
Bradbourne Lane
Aylesford
Kent
ME20 6SN
UK

Geographical regions included:

Bolivia, South Africa,

Target Audiences for this content:

Livestock farmers,

A. Description of the research output(s)

1. Working title of output or cluster of outputs.
In addition, you are free to suggest a shorter more imaginative working title/acronym of 20 words or less.

OXFEED: A Practical Decision Support to Improve the Feed Management of Work Animals.

2. Name of relevant RNRRS Programme(s) commissioning supporting research and also indicate other funding sources, if applicable.

Livestock Production Programme.

3. Provide relevant R numbers (and/or programme development/dissemination reference numbers covering supporting research) along with the institutional partners (with individual contact persons (if appropriate)) involved in the project activities. As with the question above, this is primarily to allow for the legacy of the RNRRS to be acknowledged during the RIUP activities.

R7376: Funded the initial development of the OXFEED concept and the design and implementation of a prototype software programme.
ZC0257: Funded initial field-testing of the software and management strategies developed using it.

Dr P.J. Thorne: Stirling Thorne Associates, Llangefni, UK.
Dr D. Smith: formerly Centre for Tropical Veterinary Medicine, Edinburgh, UK.
Proyecto Mejoramiento Traccion Animal (PROMETA), Cochabamba, Bolivia.
Prof. Jan Raats, Universtiy of Fort Hare, South Africa
Ms R Mbulawa, Zimbabwe.

*4. Describe the RNRRS output or cluster of outputs being proposed and when was it produced? **(max. 400 words)**. This requires a clear and concise description of the output(s) and the problem the output(s) aimed to address. Please incorporate and highlight (in bold) key words that would/could be used to select your output when held in a database.*

The two main outputs of the project were:

a. **OXFEED**: a computerised **decision support tool** for analysing the consequences of alternative **feeding strategies** for **draft animals** (including **dual-purpose cattle**).
b. Instruction manual for OXFEED.

Farmers face a number of complex decisions regarding **resource allocation** in mixed farming systems. Effective feeding of draft animals needs to be conducted at a level that is adequate to support the required work load but should avoid overfeeding that may prejudice other uses (feed for other productive livestock, mulching / green manuring). OXFEED was designed to address the following difficulties inherent in producing appropriate recommendations for feeding draft animals:

a. Generalised recommendations are often not suitable for local application as many significant variables

are not satisfactorily accounted for. OXFEED can account for local variables as it is simple to use and can be applied at a point in the information delivery chain that is relatively close to the end-user.
b. It is not feasible to collect locally the data required to describe the nutritional and physiological status of draft animals in research models. OXFEED can work effectively with locally determined qualitative data that are easily collected by extension staff or farmers themselves.
c. As recommendations generated with OXFEED are produced at a relatively local level, they can be incorporated more easily into delivery media that appropriate for local needs (e.g. language / format / complementary information).

5. What is the type of output(s) being described here?
Please tick one or more of the following options.

Product	***Technology***	***Service***	***Process or Methodology***	***Policy***	***Other Please specify***
X			X		

6. What is the main commodity (ies) upon which the output(s) focussed? Could this output be applied to other commodities, if so, please comment

Provision of draft animal power in mixed farming systems.

The general approach taken is potentially adaptable for supporting management decision making in the production a wide range of agricultural commodities. Indeed, OXFEED itself was based on approaches taken in the development of the DRASTIC decision support tool for smallholder dairy cattle. Specifically it might be of value to extend the capacity of OXFEED beyond the working bovine to equines as these are particularly important to the livelihoods of impoverished people in sub-Saharan Africa and south Asia.

7. What production system(s) does/could the output(s) focus upon?
Please tick one or more of the following options. Leave blank if not applicable

Semi-Arid	***High potential***	***Hillsides***	***Forest-Agriculture***	***Peri-urban***	***Land water***	***Tropical moist forest***	***Cross-cutting***
							X

8. What farming system(s) does the output(s) focus upon?
Please tick one or more of the following options (see Annex B for definitions).
Leave blank if not applicable

Smallholder rainfed humid	***Irrigated***	***Wetland rice based***	***Smallholder rainfed highland***	***Smallholder rainfed dry/cold***	***Dualistic***	***Coastal artisanal fishing***
X	X	X	X	X		

9. How could value be added to the output or additional constraints faced by poor people addressed by clustering this

*output with research outputs from other sources (RNRRS and non RNRRS)? (**max. 300 words**).*

Please specify what other outputs your output(s) could be clustered. At this point you should make reference to the circulated list of RNRRS outputs for which proformas are currently being prepared.

An obvious possibility would be to produce a Talking Pictures enhanced version of the OXFEED. (see dossier for project **R7855** for details).The OXFEED software is effectively an offspring of the original DRASTIC tool that forms a core model for Talking Pictures – Dairy so the technical aspects of this application would be straightforward. The routine management of working animals is often poorly supported by extension services and presents many difficult compromises for farmers themselves. Nonetheless, the availability of draft power is a keystone for crop production in many marginal, mixed farming systems. A decision support tool with the flexibility and potential for generating quantifiable impacts on poverty that have been achieved with the Talking Pictures approach could potentially be of great practical value to resource-poor producers in such systems.

Validation

B. Validation of the research output(s)

*10**. How** were the output(s) validated and **who** validated them?*

*Please provide brief description of method(s) used and consider application, replication, adaptation and/or adoption in the context of any partner organisation and user groups involved. In addressing the "who" component detail which group(s) did the validation e.g. end users, intermediary organisation, government department, aid organisation, private company etc... This section should also be used to detail, if applicable, to which social group, gender, income category the validation was applied and any increases in productivity observed during validation **(max. 500 words)**.*

It should be noted at this stage that it was not possible to validate fully the outputs of this research. Financial constraints led to only the first two years of the planned three-year work programme receiving funding. As a result, the following activities relating to the development and testing of Oxfeed remain to be completed:

a. Finalisation of the prototype software.
b. assessment of the wider acceptability of Oxfeed to intermediate users and its impacts on their capacity to provide appropriate information on the planning of feeding strategies for draft animals to end-users

The following activities were completed during the project's two-year lifespan:

Technical validation: Field studies successfully verified the capacity of Oxfeed to predict the responses of draft oxen to changes in feeding regimes and working patterns. This capacity was sustained across the changes in resource use that take place amongst seasons. The technical validation exercises indicated that Oxfeed may be considered sufficiently robust for use in assessing the impacts of changes in the field.

Acceptability to end-users: Oxfeed was evaluated with a number of extension agents in the state and NGO sectors for its general acceptability. Suggestions arising from these evaluations have been incorporated into a revised version of the software.

*11. **Where and when** have the output(s) been validated?*

*Please indicate the places(s) and country(ies), any particular social group targeted and also indicate in which production system and farming system, using the options provided in questions 7 and 8 respectively, above **(max 300 words)**.*

Bolivia:

Technical validations and assessments of acceptability were carried out in Cochabamba Province of Bolivia during 2001 and 2002.

Southern Africa:

As a prelude to assessing the wider acceptability of Oxfeed, training and assessment activities were integrated into a SANAT (Southern Africa Network on Animal Traction) workshop held at the University of Fort Hare in 2003. However, as noted under Q10, funding to implement wider out-scaling of the tool has not yet been forthcoming.

Current Situation

C. Current situation

*12. **How and by whom** are the outputs currently being used? Please give a brief description **(max. 250 words**).*

With the lack of funding to complete the testing and refinement of Oxfeed and for its effective promotion, current use of the tool is extremely limited. It is still being used by the original partners in Bolivia and some of the attendees at the Fort Hare workshop. In Bolivia, two trainers, attached to the original project have managed to train approximately 40 extension staff in the use of the tool and they have been able to use Oxfeed to support the formulation of feeding recommendations to their client farmers. Apart from this, the principal use has been in teaching of students in the Universities of Cochabamba and Fort Hare although informal linkages with extension services at some locations have allowed the evaluation and refinement of practical feeding strategies to be carried out to some extent. However, the range of applications open to these users has, necessarily, been limited by our own limited experience of applying it in the field.

*13. **Where** are the outputs currently being used? As with Question 11 please indicate place(s) and countries where the outputs are being used **(max. 250 words).***

We do not have detailed information on the current usage of Oxfeed. However, we understand that it is still used

by some at some of the 40 locations at which it was installed in Cochabamba, Bolivia. It was, at least until recently being used for teaching purposes at the University of Fort Hare in South Africa and had been installed at a mumber of other locations in South Africa in both teaching establishments and regional extension offices.

14. What is the scale of current use? Indicating how quickly use was established and whether usage is still spreading ***(max 250 words).***

We would currently estimate not more than a 20 - 30 regular users of the Oxfeed tool, Worldwide, although this may be an underestimate as there are likely to be a number of *ad hoc* users who have downloaded the software from our website.

15. In your experience what programmes, platforms, policy, institutional structures exist that have assisted with the promotion and/or adoption of the output(s) proposed here and in terms of capacity strengthening what do you see as the key facts of success? ***(max 350 words).***

The use of Oxfeed has to date been practised on only a very small scale. However, these activities have provided indications of a number of prerequisites for impact generation by this type of approach to decision support. These have been borne out by experiences with the more widely applied Talking Pictures – Dairy tool:

a. Real demand for improved knowledge for supporting local decision making (as opposed to transfer of static knowledge that may often be ill-targeted)
b. Existence of an enabling environment – i.e. the commodity is of genuine value to the farming community so they are likely to be more open to innovation in relation to it
c. Will within the implementing agency. May be under-resourced but still need the requisite skills and motivation.

Current Promotion

D. Current promotion/uptake pathways

16. ***Where*** *is promotion currently taking place? Please indicate for each country specified detail what promotion is taking place, by whom and indicate the scale of current promotion* ***(max 200 words).***

Although OXFEED was highlighted by in-country collaborators in Bolivia as an appropriate technology for wider up-scaling, follow-up activities directed for promotion of OXFEED or the improved feeding strategies identified through its use have failed to materialise.

Due to lack of funds, promotion is currently restricted to making the software and instruction manual freely available for download from our website www.stirlingthorne.com.

17. What are the current barriers preventing or slowing the adoption of the output(s)? Cover here institutional issues, those relating to policy, marketing, infrastructure, social exclusion etc. ***(max 200 words)****.*

As stated in response to Q10, a fully tested and debugged version of OXFEED is not yet available. This would, however, be a relatively small task to complete as the information required to complete it has been gathered during the earlier, completed phase of the project. Furthermore, it could be integrated with the development of Talking Pictures enhanced version of the tool that would greatly improve the value of the outputs of Oxfeed.

In the short-term, wider dissemination to intermediate users needs to be implemented through the various networks that exist to promote the improvement of draft animal management ad their contribution to poverty alleviation.

18. What changes are needed to remove/reduce these barriers to adoption? This section could be used to identify perceived capacity related issues ***(max 200 words).***

A small investment would be needed to complete the refinement of the Oxfeed software, possibly extending it so that it could be used to deliver extension directly to farmers in a pictorial format.

Implementation of a programme of wider dissemination and implementation through regional (ATNESA – Animal Traction Network for Eastern and Southern Africa / ACT – African Conservation Tillage Network) and national networks (KENDAT – Kenya Network for Draft Animal Technology; SANAT – South Africa Network for Animal Traction; TADAP – Tanzania Association for Draft Animal Power) dedicated to the promotion and support of animal traction. This should include familiarisation workshops, training of trainers and implementation and monitoring of programmes that integrate the use of Oxfeed into activities directed at strengthening the capacity of farmers to manage draft animals.

19. What lessons have you learnt about the best ways to get the outputs used by the largest number of poor people? ***(max 300 words).***

This kind of experience with Oxfeed has been limited due to the stage reached by the work. However, a clear message that has come out of the project is the need for flexibility in this kind of tool that allows real problems to be addressed effectively. This was particularly significant in Bolivia where users felt that the more reliable information that Oxfeed was able to offer them on the use of organic matter for feed enabled them to take a much more informed decision amongst the often competing alternative uses and management options for this resource. Other useful information was produced by the project on the appropriateness of a range of alternative information delivery formats and this has been incorporated into both Oxfeed itself and other information delivery products that we have been involved in developing and disseminating (e.g. later versions of DRASTIC and the Smallholder Dairy Toolbox).

Impacts On Poverty

E. Impacts on poverty to date

20. Where have impact studies on poverty in relation to this output or cluster of outputs taken place? This should include any formal poverty impact studies (and it is appreciated that these will not be commonplace) and any less formal studies including any poverty mapping-type or monitoring work which allow for some analysis on impact on poverty to be made. Details of any cost-benefit analyses may also be detailed at this point. Please list studies here.

We have no direct evidence of quantifiable impacts on poverty that might be attributable to the use of Oxfeed. As the development phase of this project was not entirely completed,

21. Based on the evidence in the studies listed above, for each country detail how the poor have benefited from the application and/or adoption of the output(s) ***(max. 500 words):***

- *What positive impacts on livelihoods have been recorded and over what time period have these impacts been observed? These impacts should be recorded against the capital assets (human, social, natural, physical and, financial) of the livelihoods framework;*
- *For whom i.e. which type of person (gender, poverty group (see glossary for definitions) has there been a positive impact;*
- *Indicate the number of people who have realised a positive impact on their livelihood;*
- *Using whatever appropriate indicator was used detail what was the average percentage increase recorded*

See Q20.

Environmental Impact

H. Environmental impact

24. What are the direct and indirect environmental benefits related to the output(s) and their outcome(s)? ***(max 300 words)***

This could include direct benefits from the application of the technology or policy action with local governments or multinational agencies to create environmentally sound policies or programmes. Any supporting and appropriate evidence can be provided in the form of an annex.

Oxfeed has been used in a number of relatively fragile farming environments (e.g. in Cochabamba, Bolivia) where the inappropriate use of draft animals can potentially cause lasting damage through reduction in ground cover and increased soil erosion. In principle the better management of these animals that may be achieved through the delivery of science-based management using the tool should ultimately:

a. make more efficient use of feed resources reducing de-forestation and allowing more crop residues to remain on the land.
b. make individual animals work more effectively reducing the populations of draft animals and their

potential adverse impacts on the environment.

c. In some areas at least, ensure that the use of draft animals continues to be attractive to farmers avoiding the switch to more environmentally damaging and less sustainable mechanical alternatives.

25. Are there any adverse environmental impacts related to the output(s) and their outcome(s)? ***(max 100 words)***

The only situation in which we might envisage adverse environmental impacts of the outcomes of applying Oxfeed would be through the stimulation of significant increases in animal population densities. For the reasons given in response to Q24, this situation is unlikely to arise.

26. Do the outputs increase the capacity of poor people to cope with the effects of climate change, reduce the risks of natural disasters and increase their resilience? ***(max 200 words)***

Decision support tools like Oxfeed generate pro-poor impacts by increase people's capacity to make informed decisions about the management of resources that support their livelihoods. A key consequence of this is that the risk associated with managing these resources is reduced, leaving them more scope to adapt to changes that may occur.
