OXFEED

For Windows 95 / 98 / NT

VERSION 10

A Working Cattle Rationing System for
the Tropics

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What is OXFEED?

The OXFEED computer software packages a new approach to rationing working cattle in the tropics.

A major problem of rationing cattle under these conditions is the lack of information on the nutritional quality of available feeds - particularly in the basal ration. This is compounded by a high degree of variation in feed quality that makes routine chemical analysis or reliance on "book values" for composition of little practical use.

In order to address these difficulties, OXFEED formulations access the whole range of variability observed in tropical feeds. Simple indicators of feed quality *that may be applied by farmers* are used to prime an artificial intelligence algorithm. This generates data to run a biological simulation of energy nutrition that predicts the outcome, in terms of live weight production achieved, of using a particular mix of feeds.

Who is OXFEED Designed For?

Most farmers in the tropics have no direct access to computer technology.

OXFEED has been designed for operation by those responsible for supporting the livestock sector, such as extension staff. It is assumed that these users will have regular contact with their client farmers and will be able to use that contact to gather the data that are required to run the system.

System Requirements

This version (10) of OXFEED is designed for IBM compatible personal computers (PCs) using Microsoft's Windows 95, 98 or NT™. It has been tested on a number of PC systems using all of these operating systems. However, its compatibility with any specific combination of hardware and software cannot be guaranteed.

Notes on Version 10

- OXFEED uses a replacement database engine (DBISAM™ from Elevate Software). This is more efficient and more compact than the proprietary "Borland Database Engine" used previously. It is also bound directly into OXFEED's main executable file, removing the need to install separate database engine software.

In addition to these major improvements, a number of minor changes have been made to the user-interface, including the option to use drag-and-drop capabilities for building up rations from their components feed ingredients. These are described in the appropriate sections of this manual.

Installing OXFEED

OXFEED is may be supplied on a CD-ROMs or can be downloaded directly from the internet (www.stirlingthorne.co.uk CD-ROM

To install OXFEED:

- Insert the CD into the appropriate drive unit on your computer;

- Open the File menu from the Windows program manager;

- Select Run from the File menu;

- Type *drive*:\SETUP where *drive* is the letter assigned to the CD drive on your system (e.g. if your CD drive is drive D, then you will type in D:\SETUP);

- Click the OK button and then follow the installation programme's on screen instructions.

NOTE: if you already have a copy of the earlier versions of OXFEED installed on your computer, you should use the uninstall programme (see below) to remove it before installing Version 10.0. Installing on top of the earlier version:

- will not preserve data and settings so these will need to be transferred manually if required;

Running OXFEED

To run the OXFEED programme after installation:

- Open the Drastic programme group in the Windows program manager;

- Double-click on the OXFEED icon to run the programme.

Uninstalling OXFEED

If you no longer require OXFEED, you may take the following steps to remove it from your system:

- Open the OXFEED programme group in the Windows program manager;

- Double-click on the Uninstall OXFEED icon to run the removal programme.

The User Interface
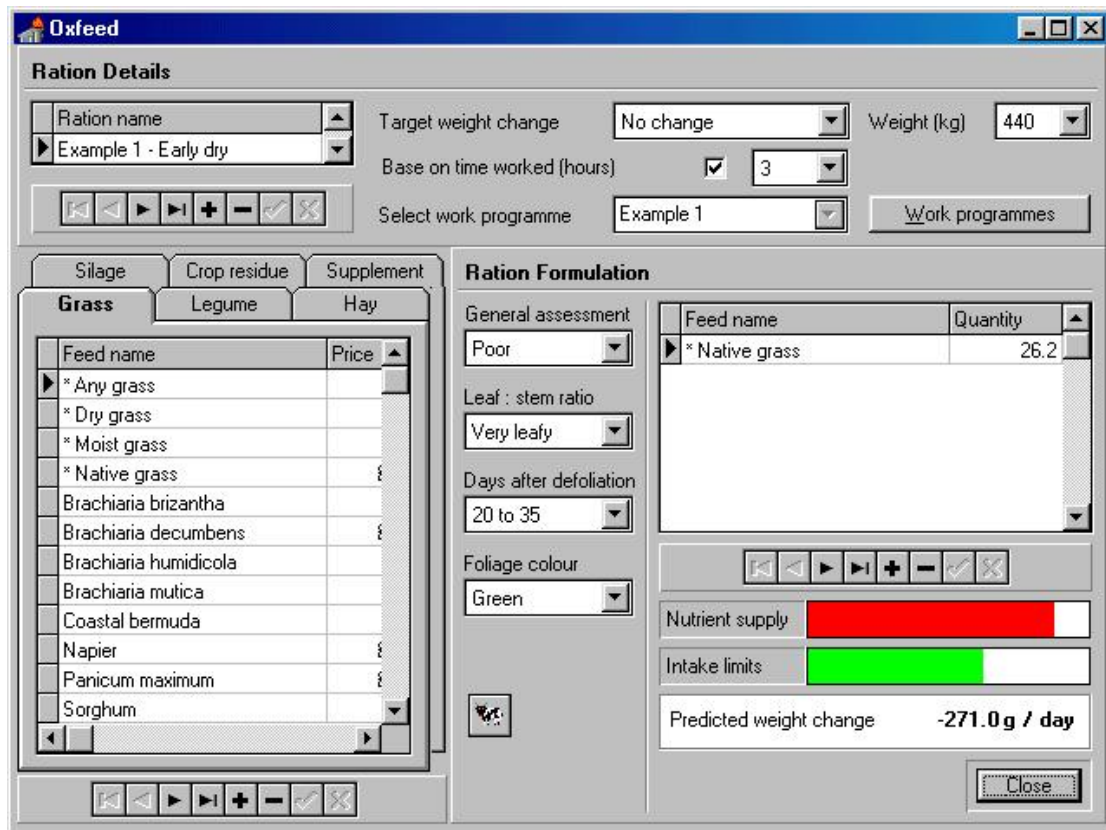
OXFEED's user interface has been designed to be intuitive and simple to use. It consists of three panels that allow the user to make changes to OXFEED's database:

The Feed Composition Panel

The data required to describe feed compositions may be entered and viewed on the feed composition panel. This is situated on the bottom, left hand side of the user interface.

The feed composition panel has six tabbed pages, each displaying data for feeds of a particular type. These are used to:

- Enter data describing new feeds so that these may be included in ration formulations;

- Edit feed data that are already included in the feed composition database.
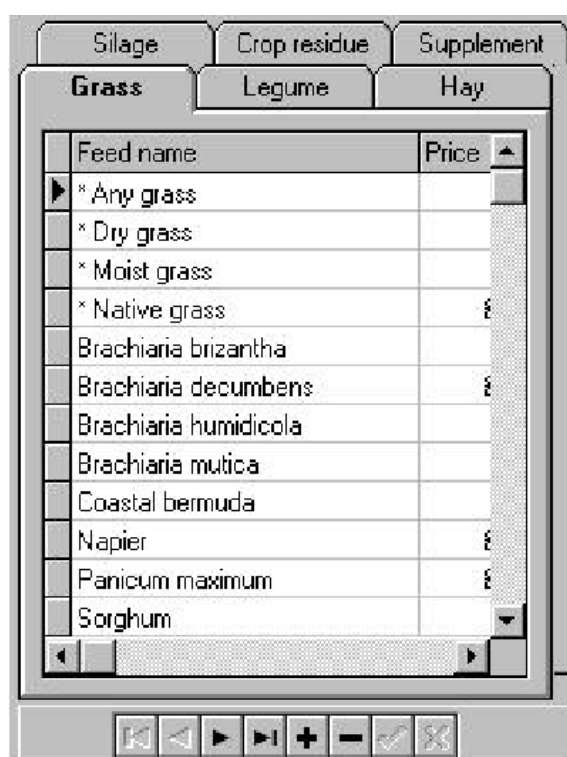
The Ration Details Panel

Data describing the type of animal that will consume the ration are entered and viewed on the ration details panel. This is located at the top of OXFEED's user interface.

Individual rations are given a unique name for easy identification.

The Ration Formulation Panel

The ration formulation panel is the main worksheet used for interactively creating and maintaining ration formulations. It can be found on the bottom, right hand side of the user interface.

In addition to the close button and the buttons used to activate some of OXFEED's supplementary features, the ration formulation panel allows users to enter and edit Ration Formulation Data and to follow the progress of interactive ration formulations.

OXFEED's Database

The database is accessed via the grids, input boxes and drop-down lists on the three panels of the user interface.

Entering and Editing Data

Access to data in OXFEED's database is controlled by the navigator bar under each grid.

Each button on a navigator bar displays a context-sensitive, pop-up prompt if the mouse pointer is allowed to rest above it.

First Button

[|◀]

Move to the first record in the database.

Previous Button

[◀]

Move to the previous feed in the database.

Next Button

[▶]

Move to the next record in the database.

Last Button

[▶|]

Move to the last record in the database.

Add Button

[+]

Add a new, blank record to the database.

Delete Button

[−]

Delete the currently selected record from the database.

Accept Button

[✔]

Accept changes made to the current record in the database.

Cancel Button

[✖]

Cancel and changes made since the last changes were accepted.

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Feed Composition Data

Feed composition data may be entered or edited in the grids on the six tabbed pages of the feed composition panel.

Including a New Feed

Use the add button on the feed composition panel's navigator bar to include a new feed in the database.

Each tabbed page displays data for one type of feed.

- Grass
- Legume
- Hay
- Silage
- Crop residue
- Supplement

Make sure that new feeds added to the database are included on the correct page.

Scrolling to the Data Columns

By default, the grid on the feed composition panel displays only the names of feeds in the database and their prices (as entered by the user).

To enter feed composition data, scroll the display using the scroll bar at the bottom of the grid.

Variability in Feed Compositions

OXFEED has been designed to handle the high degree of variability in the compositions of tropical feeds.

To accomplish this, both minimum and maximum values (usually in grammes / kilogramme) are required for each "nutrient" in the feed composition database. These should reflect the extent of variation in composition that might be encountered in normal practice.

Data for Supplements

For supplements, a precise value is entered in the minimum field for each nutrient.

Variation in the composition of supplements is generally more quantifiable but less easily predicted from qualitative indicators than that in the composition of basal feeds. Using a minimum value allows a safety margin to be built into the ration formulation process.

Precise Compositions for Basal Feeds

Users may wish to enter precise values for feed types other than supplements.

This might be the case when:

- An analysis is available for the particular example of the feed that will be used.
- The composition of the feed is thought to vary little.

Precise values may be entered in the minimum column and setting or leaving the value in the maximum column as zero.

One of the strengths of OXFEED is its ability to cope with variability in feeds. Setting precise values where these are not reliably known will produce unreliable results.

Ration Details

Ration details are recorded in the grid and input boxes of the ration details panel.

When changes have been made to the values of any of these variables, the accept button on the ration details navigator bar must be clicked before they are stored and can take effect in predictions for the current ration.

Ration Name
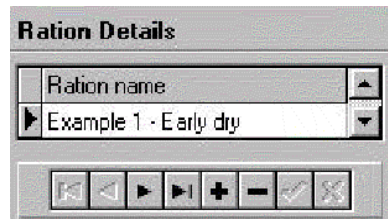
OXFEED works with named rations stored in the database. This allows rations to be re-formulated to account for changes in the prices and availability of different feeds.

The navigator bar under the grid containing ration names may be used to control changes in any of the ration details.

Body Weight
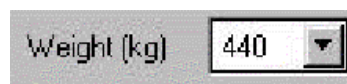
Animal body weights are selected from the bodyweight drop down list.

Body weights should be entered in kilogrammes.

Weights in the range 150 – 650 kg are accepted.

Body Weight Changes

Target body weight changes are selected from the body weight change drop down list.

Constructing work programmes

Work programmes are constructed in a similar way to rations. The first step in constructing a new work programme is to add an item to the Programme item pane by selecting the Add button from the database controls beneath the list of available programmes. Then add a unique programme name to the newly inserted cell. Programmes can also be deleted and edited in the same way as items in the feeds data base.

A work programme consists of a group of activities that an animal may carry out over a period of a day. For example an animal may walk 5000 m to a field to plough, the cover 2000 m whilst ploughing, these should entered as two separate activities.

A work activity is added to a work programme by selecting a item from the available activities list, then clicking the add button on the record control panel under the activities to be included in programme grid.

The distance covered by the animal when doing each activity is entered into the appropriate cell in the distance column of the data grid, and then accepted by clicking the Accept button.

The energy demands of each activity should be modified according to the prevailing conditions using the appropriate indicators for each activity. Changes should be accepted or rejected using the accept or cancel buttons on the database control panel under activities included in programme.

Once a work programme has been created or changed, the work programme panel should be closed. The appropriate work programme can then be selected in the main OXFEED panel.

Ration Formulation Data

Data used during interactive ration formulation are entered in the drop-down lists and grid on the ration formulation panel.

Adding Feeds to a Ration
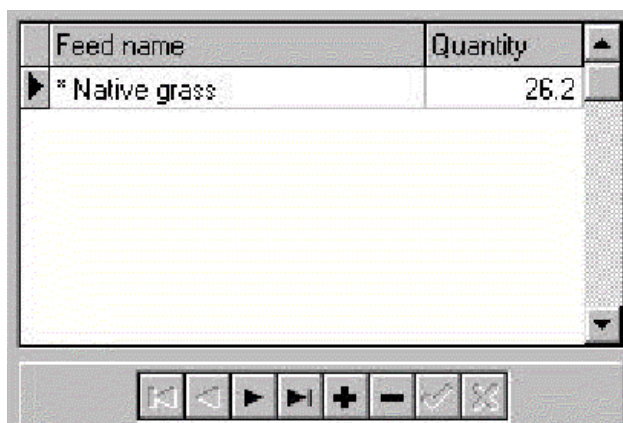
Feeds currently included in the ration are displayed on the grid on the ration formulation panel.

There are two ways of including a feed in the current ration:

Method 1

- In the grid on the appropriate page of the feed composition panel, select the feed that is to be included.

- Press the add button on the ration formulation navigator bar.

- Press the accept button on the ration formulation navigator bar to confirm the inclusion or the cancel button to abandon it.

Method 2

- Click on the feed in the grid on the feed composition panel's grid.

- With the left mouse button held down, "drag" the cursor over to the grid on the ration formulation panel.

- Release the mouse button to "drop" the selected feed into the ration.

Setting Quantities of Feeds in a Ration

Quantities of included feeds are specified in the quantity column of the grid on the ration formulation panel. They may be set in three ways.

Entering Feed Quantities Directly

Known or estimated feed quantities may be entered directly in the grid on the ration formulation panel:

- Select the grid square in the quantity column for the feed quantity that is to be changed.

- Enter the quantity, in kilogrammes / animal as fed, that is to be included in the ration.

- Press the accept button on the ration formulation navigator bar to confirm the quantity included or the cancel button to abandon the change.

Estimating the Intake of Grazed Forages

Under grazing conditions, OXFEED can assist in estimating forage intake:

- In the ration formulation grid, select the forage that is being grazed.

- Press the grazing intake button.

- In the grazing intake predictor dialog that appears, set the percentage of the current forage in the pasture the number of hours during the day that the animals are at pasture, and, where appropriate, the number of grazing hours spent at high ambient temperature.

- Press the Accept button to enter the predicted value in the ration formulation grid.

This process may be repeated for other grazed feeds in the current ration.
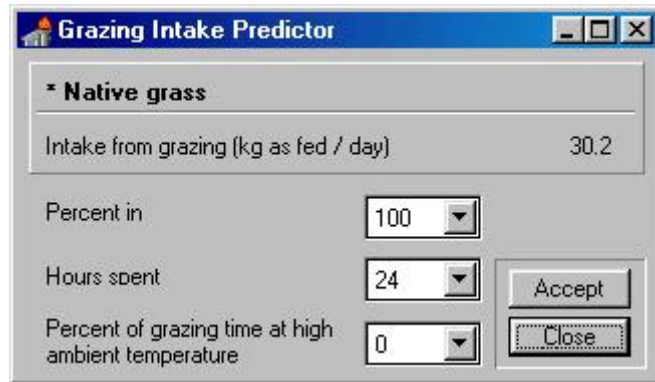
Deleting Feeds from a Ration

Feeds currently included in a ration may be deleted to reflect changes in availability.

To remove a feed that is currently included in the ration:

- Select the feed in the ration formulation grid.
- Press the delete button on the ration formulation navigator bar.
- Select OK in the confirm deletion dialog box that appears.

Assessing the Quality of Basal Feeds
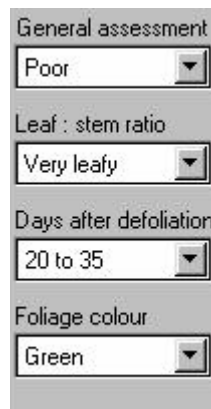
OXFEED uses qualitative indicators to assess the quality of basal feeds used.

Values of the qualitative indicators are set using the drop down lists that appear on the ration formulation panel when these are required for the currently selected feed in the ration.

When a new basal feed is added to a ration, default values are set for the qualitative indicators that represent an average quality for that particular feed.

A more detailed description of these indicators is presented in Appendix 1.

Qualitative Indicators

The qualitative indicators used are:

- A General Assessment of nutritive value.
- An indication of the Leaf : Stem Ratio.
- The number of Days After Defoliation (grazing or cutting).
- The Foliage Colour. Essentially the degree of yellowing of the leafy material.

These are intended to be simple, relative indicators that are quick to apply in the field. Users should not spend too much time agonising over the choice of values. OXFEED has been constructed so that inaccuracies in the assessment of individual indicators tend to cancel each other out.
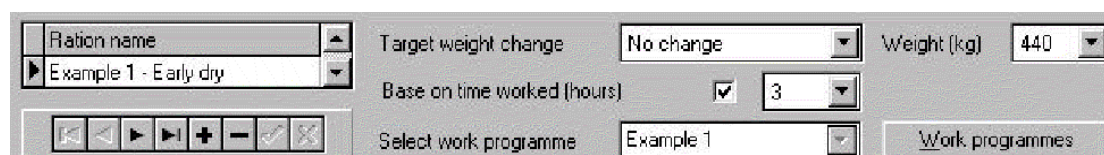
NOTE: Changing the quality indicators for an individual feed in an existing ration may appear to give ambiguous results. For example, increasing leafiness of a grass may result in a lower predicted live weight gain. This is because the qualitative indicators influence a number of aspects of nutritive value. Although more nutritious, leafy grass has a lower dry matter so cannot be compared, on the as-fed basis used for OXFEED formulations, with a poorer quality grass. Therefore, you must remember to re-assess likely intakes (using the grazing intake predictor or otherwise) when you change quality indicators of feeds used in a ration.

It is intended that the qualitative indicators should be assessed with the participation of the farmer who will use the ration. A suggested format for Consultations with Farmers is included with OXFEED.

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Ration Formulation with OXFEED

Ration formulation with OXFEED is an interactive, iterative process.

Predicting Performance on an Existing Ration

OXFEED may be used to monitor the consequences of an existing feeding strategy.

Read off the predicted live weight change on the ration formulation panel after changes have been made in the values of input variables; i.e. changes in the feeds included in the ration or in the ration details.

Formulating Rations to Meet Target Yields

In order to achieve this, predicted live weight changes are compared with live weight changes targets.

Compare the predicted live weight changes with the target live weight changes that has been set on the ration details panel.

The progress bars on the ration formulation panel allow the progress of a formulation to be monitored as changes are made:

Meeting Nutrient Requirements

The nutrient supply gauge indicates the extent to which the current ration supplies the nutrients needed to meet the target live weight changes. It is situated on the ration formulation panel.

The colour of the gauge's progress bar is interpreted as follows:

Red   Nutrients supplied meet less than 95% of requirements.

Yellow   Between 95% and 100% of requirements are met.

Green   The current ration supplies 100% or more of the required nutrients.

Monitoring Intake

The intake limits gauge provides an indication of the current level of intake in comparison with the animal's appetite limit. It is situated on the ration formulation panel.

The colour of the gauge's progress bar is interpreted as follows:

Red   Dry matter supplied by the current ration exceeds the predicted, feasible intake.

Yellow   Actual intake is likely to be between 95% and 100% of the predicted, feasible maximum.

Green   Less than 95% of the predicted, feasible maximum intake is supplied by the ration.

It is difficult to predict the voluntary intake of working cattle effectively. The intake limits gauge should, therefore, be regarded only as a rough guide.

Help Us to Evaluate OXFEED

OXFEED is currently undergoing continuous improvement. You can help us in this process.

Our intention is that the system should be genuinely useable for dairy rationing in the tropics. In order to help us continue to improve the system for its intended users, we invite feedback in the form of general comments or responses to the brief questionnaire that follows:

Ease of Use

Data

Predictions

General Comments

Each page of the questionnaire may be printed out directly from the help system or may be found in Wordperfect (QUEST.WPD) or Word (QUEST.DOC) formats in the \DOCS subdirectory of your OXFEED installation.

Please return completed questionnaires to:

Dr Peter Thorne

Stirling Thorne Associates

PO Box 23

Llangefni LL74 8ZE

UNITED KINGDOM

E-mail: peter.thorne@stirlingthorne.co.uk

Ease of Use

1. Did you experience any problems installing OXFEED on your system:

No

Yes (specify)...……………

....……………

....……………

2. How clear did you find the instruction manual:

| Very | 2 | 3 | 4 | 5 | 6 | very |
| unclear | | | | | | clear |

3. How easy was the OXFEED interface to use:

| Very | 2 | 3 | 4 | 5 | 6 | very |
| difficult | | | | | | easy |

4. Please offer any general suggestions that you may have for making OXFEED easier to use:

....……………

....……………

....……………

Data

5. How complete (for your purposes) did you find the data set provided with OXFEED:

Very	2	3	4	5	6	very
complete						incomplete

6. Please suggest any specific feeds that might usefully be included in the database:

....……………

....……………

....……………

7. Did you find the explanation of the qualitative variables for the basal diets easy to understand:

Very	2	3	4	5	6	very
difficult						easy

8. If you have used the system with farmers in the recommended fashion please state how easy you found this:

Very	2	3	4	5	6	very
difficult						easy

9. Please offer any specific suggestions that you may have on how to improve data handling in OXFEED:

....……………

....……………

....……………

Predictions

10. Did you notice any consistent under or over prediction when using OXFEED:

    Under prediction
    Over prediction

Give details...…………...
....……………
....……………

11. Did you notice any bugs in the software:

....……………
....……………
....……………

General Comments

12. Please enter any other comments that you may have regarding OXFEED:

....……………
....……………
....……………
....……………

Appendix 1: Advice Notes on the Use of OXFEED's Qualitative Indicators

General Assessment

Description	Used to assimilate the general perception that the farmer or extension agent has of the ability of a particular forage to meet the requirements of dairy production.
Values allowed	Very poor
	Poor
	Moderate
	Good
	Very good
Used for	Grass
	Legume
	Hay
	Silage
	Crop residue

Leaf : Stem Ratio

Description	Leafy material is generally of higher quality (higher nitrogen and lower lignification) than stemmy material.
Values allowed	Very stemmy
	Stemmy
	Stem = leaf
	Leafy
	Very leafy
Used for	Grass
	Legume
	Hay
	Silage
	Crop residue

Days After Defoliation

Description	Young regrowth is generally of better quality than aging foliage.
Values allowed	More than 45
	35 to 45
	20 - 35
	7 to 20
	Less than 7
Used for	Grass
	Legume

Foliage Colour

Description	Foliage colour may be used to indicate the nitrogen status of the plant. Yellow material is often indicative of nitrogen deficiencies.
Values allowed	Yellow
	Greenish yellow
	Yellowish green
	Green
	Deep green
Used for	Grass

Moisture Content

Description	It is usually possible to gauge roughly the moisture content of dried forages and silages qualitatively. Over-moist forages may have experienced loss of nutrients during storage.
Values allowed	Very moist
	Moist
	Normal
	Dry
	Very dry
Used for	Hay
	Silage
	Crop residue

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