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**“BREEDCOW AND DYNAMA”  
A FRAMEWORK FOR ECONOMIC AND FINANCIAL ANALYSIS OF CHANGE OPTIONS  
IN RANGELAND MANAGEMENT**

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## **INTRODUCTION**

Many of the problems of management choice facing pastoralists in the rangelands may be considered by applying conventional economic and farm business management budgeting techniques.

The Breedcow and Dynama herd budgeting software (Holmes 2002) is a package of nine interrelated programs applying the tools of economic and financial analysis to consider the likely impact of husbandry, resource utilisation, marketing, or other changes on business performance.

Training in budgeting and profit and financial evaluation processes is provided by the project “Better Decisions in the Business of Beef”. This encompasses two day training workshops, as well as software support, improvement and promotion. Clients are departmental staff (including NT and WA), staff of other government and quasi-government agencies, educational institutions, consultants, banks, accountants, valuers, lawyers, large pastoral companies and family grazing enterprises.

Breedcow and Dynama is suitable for the analysis of extensive cattle enterprises, mainly in northern Australia. Breedcow and Dynama software was first released commercially in 1990. Breedcow and Dynama software and Better Decisions training are available from QDPI.

## **ANALYTICAL PROCESSES**

Change options may be considered at an enterprise, industry or geographical scale. The analytical processes of Breedcow and Dynama are based on four themes:

The current situation of the business and projections of business position over time (“where are we now and where are we going?”). The projection starts from the current herd structure, animal productivity, asset and liability base and budget. Projections are made of future herd structure and turnoff, cash flow, net income, asset and liability values, and net worth. Projections may be for up to ten years with provisions for going out further if necessary. Financial projections are based on herd dynamics and productivity estimates. Alternate strategies may be compared using this process, though this is best done after considering options using the next process.

Prospects for improved herd performance (“is there a better way?”). This process uses stable state herd modelling for the quick testing of options that alter the nature or quantity of herd output. Such options include different turnoff policies, husbandry changes affecting reproduction, survival or growth, stocking rate changes, or resource management changes whose impact is to be measured by changed carrying capacity and/or animal response. This process (using the Breedcow program) determines the comparative profitability of options that may then be back in the first theme (using the Dynama program) to determine affordable pathways to change. Whilst Breedcow does not consider directly the issue of capital investment required for change, improved profit (or improved gross margin) may be judged against the need for new investment. Dynama does include new investment and therefore deals with the issue in its entirety.

No-change and change scenarios described in Breedcow may be used (electronically) to define the end points of the Dynama files comparing scenarios, and the sales policies used to arrive at those end points.

Handling unplanned outcomes (“what do we do when the wheels fall off?”). Despite the plan, droughts still happen, prices change, and financial crises come and go. The Destock program is used to guide forced sales decisions in the face of drought or the unavoidable need for cash. The object is to reduce the grazing pressure, or find the cash, whilst doing least damage to future income. The Destock program may equally be used to guide cattle purchases for drought recovery or for the utilisation of a good season. This approach is relevant to the year by year running of a cattle business, but not necessarily relevant to the evaluation of rangeland management strategies.

Analysing the costs and benefits of change using investment analysis processes (“change as an investment”). Pathways from the current situation to the future are laid out in Dynama. To consider the benefits of change we need to compare what might have happened without the change (referred to as the “do nothing” scenario) with what we expect to happen if the change is implemented (the “change” scenario). “Do nothing” could be represented by an outcome with a stable trend, or it could be an outcome trending down as in an overstocking scenario.

The Investan program compares two Dynama files, “do nothing” and “change”, starting with the same assets and herd, displaying annual cash flow differences, and asset value difference at the end of the analysis. From these values are calculated the Net Present Value (NPV), the Internal Rate of Return (IRR), and the Annualised Return. NPV represents the profit from the change, expressed as its value if received today instead of as it accrues. The Annualised Return expresses this as its annual equivalent. The IRR is the return on capital invested, where “capital” comprises the deficits incurred early in the change, whether as a result of expenditures or income sacrifices.

Investan may be used to compare 10 year runs of Dynama or, optionally, 20 year runs. Investment analysis procedures are normally applied to quite long time periods, up to 50 years, although the impact of outcomes beyond 10 or 20 years is usually minimal.

## **TWO RECENT APPLICATIONS OF BREEDCOW AND DYNAMA**

A recent application of the Breedcow and Dynama processes was to the evaluation of Grazing Land Management (GLM) improvement scenarios for the education module developed for the MLA Edge Network. For each of four geographical areas, a “base” file was developed in Breedcow which then also defined the starting point for both the “do nothing” and the “change” files in Dynama. For each of the changes being considered, another Breedcow file was developed defining the endpoint of the change. Using other means such as the GRASP model (Littleboy and McKeon 1997) and expert opinion, probable pathways from “base” to “change” were defined, expressed as carrying capacity and animal response (branding rates and turnoff weights). Each proposed improvement was compared in Breedcow with the “base” file as an initial screening, then compared in Dynama and Investan as “change” versus “do nothing” to judge overall profitability of the option.

Another rangeland related application was the assessment of a woody weed control program for a large pastoral company. This entailed expenditure of about \$2m to obtain benefits over the next 20 years. Using the Breedcow and Dynama software, company staff and a QDPI adviser were able to show a projected return (IRR) on expenditure in excess of 12% per annum. This, along with other considerations, was sufficient to convince the board of the company to approve the program.

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