Economists are called upon to advise decision makers, ranging from farm operators to government and industry, on methods of optimising the use of capital, labour, land and management, in productive processes. Often, a summary technique is needed which can adequately assess a wide range of agronomic, physiological, meteorological, and economic information, in the most cost effective manner. Bio-economic computer simulation modelling is one technique used to achieve this.

In the development of FEEDBREED, a beef breeding simulation model, the aim is to achieve a compromise between biological complexity and economic applicability. FEEDBREED considers the effects of specific management strategies in beef cattle breeding systems within a specified economic environment of input and output prices. Examples of these management strategies include: supplementation; animal health inputs, improved pasture establishment and cattle husbandry techniques. The model examines physical production from any particular management strategy and conducts an economic analysis.

The FEEDBREED model:

- relates animal growth to GROWEST, a pasture growth index based on readily available climatic parameters (Fitzpatrick and Nix, 1970).

- improves on simple herd dynamics models in that equations for breeder fertility are based on weight for age, rather than age.

- can equally analyse a fattening, as well as a breeding enterprise.

- improves on the economic analysis using gross/margins as it incorporates risk analysis, i.e. it establishes the probability of obtaining different returns, given producer attitude towards risk.

- can be used to assess the likely pay-off to proposed biological research into animal productivity (the ratio of outputs to inputs) i.e. increased efficiency in animal breeding and nutrition.

To maximise profits, therefore, the producer needs to select a management strategy which would increase productivity to the point where the marginal returns from this strategy equal the marginal cost of implementing it. By quantifying the economic returns to various strategies, the model provides a range of alternatives from which the producer chooses one corresponding most closely to his own personal utility preferences between cash, leisure and risk.