

GSL Integrated Resource Allocation Farm Systems Model.

How is GSL different to other modelling options?

GSL as a Bio-economic model uses a different analysis method based on an improved technology.

It is known as linear programming (LP) but actually the GSL model allows use of non linear as well as linear data necessary to establish the optimal production level for any mix of resources in a biological production system. It is able to allow for diminishing returns to successive input variations and can determine the point at which an additional input no longer covers its cost or, simply where the system starts to lose money.

The primary advantage of LP modelling is due to the use of actual farm data rather than averaged or “representative” data. Averaged data cannot identify when the manager should cease adding resources.

The GSL model uses economic analysis as an integrated part of the resource allocation rather than assigning an averaged or benchmarked gross margin after the production calculation is decided. Only LP can achieve such a credible systems specific economic result.

GSL uses information detail that other bio-economic modelling systems either do not or cannot use. Data includes:

- actual farm herd profiles,
- number of cows,
- cow details and production per cow,
- calving and dry-off dates

It is the costs and income that each of these resources generate that are crucial to optimising dairy farm profit. These inputs are integrated within the GSL systems model and are optimised for “best fit” to existing available resources.

Other “Comparative analysis” programs assign averaged data for many of these resources and in doing so lose the detail that is crucial to identifying the specific constraints within particular systems. It is this feature that makes GSL so much more useful than any other modelling program.

Benefits from Use of GSL Program

1. Actual farm can be replicated in detail to replicate current production system as a base for comparison. The LP system can then be allowed to substitute and/or alter the use of any resource to optimise the economic result. This allows options to be “discovered” rather than be decided before the analysis takes place. This encourages innovation, rational thinking and new management motivation.
2. The GSL process rapidly highlights the constraints in any system and provides insights and implementation strategies into the likely opportunities and economic rewards for changes to the allocation of resources that have been tested.
3. This then allows accurate evaluation of the economic benefit of any change of resources utilised.
4. Includes on-farm carbon emissions as part of each individual solution.
5. Production system result can be taken through from cash flow generated as part of model solution to full analysis of return on assets if required. This is normally completed once GSL model runs have been refined to the particular system management seen as best for a particular circumstance.

Most importantly this is an *integrated* production and economic model made possible through use of LP. No other system achieves the multiple layers of detail and awareness that the application of the GSL LP to farm systems can achieve. This ensures close modelling of farm reality and an objective answer which can be modified to suit management preferences. Any such modification also changes the economic outcome and this can be weighed up against any other priorities that may apply.

Such a model may be seen to merely reduce the time and cost of gaining the knowledge those years of perceptive management experience brings, but uniquely it allows a rapid appraisal of proposed change, something that looking at historical data can never do.