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# Economic Selection of Enterprises

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In farm management analysis, it is normal practice to recognise that a farm business may be composed of a number of different enterprises. For each enterprise it is possible to determine an enterprise gross margin, which is a measure of the financial contribution that is made by the enterprise to the whole farm income. This gross margin takes into account the value of all of the product less any direct costs associated with the production from that particular enterprise. However, gross margins do not normally take account of the setting-up costs of the enterprise, or any indirect benefits or penalties that may be associated with the enterprise.

## The Gross Margin System

The gross margin may be used as a measure of the financial efficiency of a particular activity by expressing the enterprise gross margin on a per unit basis. For example, if a cashmere breeding flock of 500 does is expected to give a total enterprise gross margin of $40.50 per doe or $21.31 per "dry sheep equivalent" (d.s.e.). These figures provide a measure of the financial efficiency of the enterprise and may be compared with alternative enterprises, either already on the farm or under consideration.

## Land as a Limiting Factor.

Comparison of enterprises and selection of the most profitable alternative enterprises on the basis of gross margins per d.s.e. or gross margins per hectare of land grazed, assumes that land is the most limiting resource available to the farmer. On this basis assumed profits will be maximised by selection of those enterprises with the highest gross margin per d.s.e. or per hectare.

Figures comparing four alternative livestock enterprises for southern NSW (Lloyd Davies & Trevor May, 1989) were as follows:

| | $ Gross Margin/dse |
|---|---|
| Cashmere Breeding | 21.31 |
| Beef – Yearling Production | 14.85 |
| Sheep – Prime Lamb Prod. | 15.94 |
| Merino Wethers | 30.55 |

From these data it may be concluded (at that point in time) income would be maximised by stock selection in the order of merino wethers, cashmeres, sheep (prime lambs), beef (yearling production). That is to say that where land is the limiting factor livestock returns will be maximised by selection of the enterprise offering the highest returns per d.s.e. An example of gross margin calculation for a cashmere enterprise is shown in Appendix 1.

## Capital as a Limiting Factor.

In many situations land may not be the most limiting factor. The availability of capital may be a more severe limiting factor. In this case, farm income would be maximised if the available capital is allocated to those enterprises that offer the highest return on investment.

Using the same data as was used to produce the gross margins/d.s.e. above, gross margins per $100 invested in livestock capital can also be obtained, with following results:

| | $GM/$100 of livestock capital |
|---|---|
| Cashmere Breeding | 112 |
| Beef-Yearling Production | 54 |
| Sheep-Prime Lamb Prod. | 70 |
| Merino Wethers | 112 |

This indicates that a farmer investing in cashmeres or merino wethers would receive a return of 112% on livestock capital investment, compared with 54% for beef and 70% for lamb production. In other words, the first two options return the investment in one year compared to two years for the other alternatives. Thus (in 1989), where livestock capital was limited, the best choice for investment in the above options was evenly divided between cashmeres and merino wethers.

In the comparison based on gross margin per d.s.e. the merino wethers had a $9.25 per d.s.e. (43%) advantage over cashmeres. From this it is obvious that gross margins calculated on the assumptions that land is limited, but capital is unlimited, will often produce quite different economic indicators than gross margins based on the assumption that capital is the most limiting factor.

Therefore, farmers must individually consider their own situation and establish their own MOST limiting factor. Farm income will only be maximised if enterprises are selected on the basis of their expected $gross margin return to the most limiting factor.

## Economic Analysis of Enterprise Options

Gross margins obviously play an important role in the economist's approach to selecting farm enterprises. However, it is very important to remember that the data used to calculate gross margins is based on the market prices applicable at the time of calculation. Farmers have generally come to accept the "boom and bust" nature of the returns for agricultural products in recent times, but these variations are not always shown in comparisons of gross margins, and they are sometimes ignored when they are shown in more detailed documents.

Yet these variations cause very large differences between gross margins calculated at different times. Unless care is taken to average out these variations, quite incorrect conclusions may be drawn. This is particularly important when seeking to select an enterprise from a set of different options. Always examine the assumptions on pricing in all gross margins under consideration, and weigh the value that might be placed on them in making a final judgement.

With this in mind, an economist would evaluate the possibility of introducing a farm enterprise in four main steps (Lloyd Davies, 1997).

"These are:

1. Calculate and compare gross margins on a per d.s.e. basis and on a per $100 of livestock capital basis.
2. If step 1 looks attractive, estimate the capital required to get into the venture.
3. Prepare a partial budget to calculate the return on capital from your investment.
4. If the partial budget is favourable, look to the longer term, prepare a cash flow projection and use discounting to calculate a net present value for the project and an internal rate of return. This should be compared with other possible projects on the property."

In order to illustrate the first three steps, Lloyd Davies examines four different situations, which are based on October 1995 gross margins and are shown at Appendix 2. He draws attention to Situation 3, which shows that, in comparison to Situation 2, a changed situation can turn predicted returns from poor returns to quite attractive returns. He notes that a return of 39% was achieved when there was an abundance of weeds that (in this case) goats could utilise, and when the capital requirements for improvements were not that high. Situation 4 provides an example of a negative result. He says that:

"Results are highly dependent on the relative size of the gross margins used. These (four situations) are only a few of an almost infinite range of possibilities that may be available. A return on capital of at least 15% is generally recommended in order to justify the risks."

To obtain a 15% return on capital from the introduction of a goat enterprise may depend upon one or more of the following situations:

- Increased overall carrying capacity because there is a lot of browse available on the property.
- Reduction of weed, scrub and regrowth control costs.
- Diversification, including that from a combination of meat and fibre returns.
- Increased carrying capacity of other species from the goats contribution to pasture improvement.
- Low capital outlay to introduce and run the enterprise.
- Gross margins are higher for goats than competing enterprises.

As regards the fourth step, some may need help to calculate net present value and internal rate of return. Your local agricultural economist or your accountant will be able to help you. There are computer packages available as there are, also, packages for calculating gross margins based on your own assumptions and point in time.

## APPENDIX 1

***CASHMERE ENTERPRISE Replacements retained until after first shearing.***
***Lloyd Davies, Economist, NSW Agriculture, Maitland.*** Feb-97

This budget is based on domesticated feral does that have been running as a managed flock for at least eight years and are mated to selected bucks. All progeny are retained until after the first shearing.

**Assumptions**

| | | | | |
|---|---|---|---|---|
| Number of does | | | | 200 |
| Number of ages in does | | | | 5 |
| Down Production & prices | | Down Yield g/hd | Down Price $/kg | |
| Kids | | 100.00 | 90.00 | |
| Does | | 140.00 | 80.00 | |
| Bucks | | 160.00 | 80.00 | |
| Buck percentage (%) | | | | 2% |
| Sale price ($/hd) | - wethers | | | 18 |
| | - cull doe maidens | | | 25* |
| | - does c.f.a. | | | 10 |
| | - bucks c.f.a. | | | 14 |
| Buck purchase price ($/hd) | | | | 300 |
| Kids weaned (%) | | | | 125 |
| Death rate (%) | - adults | | | 3% |
| | - kids | | | 3% |
| Running costs: ($/head); incl. 1 shearing (done by owner with casual assistance); drenches 2 adults, 4 young stock; lice control; 2 vaccinate, predator control & supplementary feeding | | | | 6.00 |

**Returns (net)**

| | | $ | |
|---|---|---|---|
| Cashmere | | | |
| does | | 2240.00 | |
| kids | | 2250.00 | |
| bucks | | 51.20 | |
| Sales | | | |
| wether weaners | 121 | 2178.00 | |
| does hoggets | 79 | 1975.00 | |
| does c.f.a. | 36 | 360.00 | |
| bucks c.f.a. | 1 | 14.00 | |
| | **Total** | | 9068 |

•There is currently an improved market for does because they are being joined to Boer bucks.

**Variable costs**

| | |
|---|---|
| running costs (does + kids) | 2700.00 |
| buck purchase | 300.00 |
| cashmere selling costs - Pool 8%, research 1%, promotion 3%* | 544.94 |
| **Total** | 3545 |

GROSS MARGIN

| | flock $ | doe $$ | d.s.e.* |
|---|---|---|---|
| returns | 9068 | 45.34 | |
| variable costs | 3545 | 17.72 | |
| **G.M.** | **5523** | **27.62** | **$12.17** |

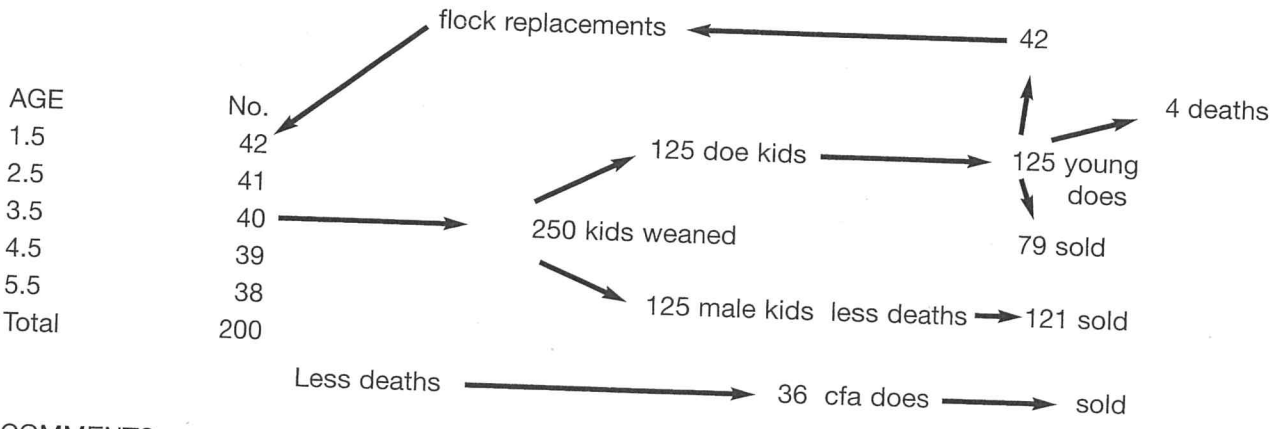
* See comments above and on the next page.

EFFECT OF CASHMERE PRICE AND PRODUCTION ON GROSS MARGIN PER HEAD

| Cashmere production changes | Price Variation in Cashmere (%) -30 | -15 | 0 | 15 | 30 |
|---|---|---|---|---|---|
| -30 | $17.43 | $19.52 | $21.62 | $23.72 | $25.82 |
| -15 | $19.52 | $22.07 | $24.62 | $27.17 | $29.71 |
| 0 | $21.62 | $24.62 | $27.62 | $30.61 | $33.61 |
| 15 | $23.72 | $27.17 | $30.61 | $34.06 | $37.51 |
| 30 | $25.82 | $29.71 | $33.61 | $37.51 | $41.40 |

CASHMERE GOAT BREEDING FLOCK STRUCTURE

| | |
|---|---|
| No. ages in flock | 5 |
| Death rate (%) - does | 3% |
| - kids | 3% |
| Kid rearing (%) | 125 |
| Flock size | 200 |




COMMENTS

* A cashmere doe and kid is rated at 2.27 d.s.e. in this budget.

## APPENDIX 2

**Situation 1:**
300 does run on country with briar. No reduction in other stock numbers required. Saved spray costs $3000. Cost of capital improvements $20,000.

| | | |
|---|---|---|
| Capital purchase costs | | $ |
| 300 does @ $22 | | 6600 |
| 6 bucks @ $300 | | 1800 |
| Capital improvements | | 20000 |
| Net cost of change over | **(A)** | **28400** |
| | | |
| Gross margin does @ $26.77/hd. | | 8031 |
| plus saved spray costs | | 3000 |
| Net Benefit | **(B)** | 11031 |
| | | |
| **Return on capital (B)/(A)*100** | | **39%** |

**Situation 2:**
300 does run on highly improved pasture will replace 300 ewes. Cost of capital improvements $6000.

| | | | |
|---|---|---|---|
| Capital purchase costs | | | $ |
| 300 does @ $22 | | | 6600 |
| 6 bucks @ $300 | | | 1800 |
| Capital improvements | | | 6000 |
| | **14400** | | |
| Less sale of ewes @$20 | 6000 | | |
| Less sale of rams | 600 | | |
| | **6600** | | |
| Net cost of changeover | | **(A)** | 7800 |
| Gross margin does @ $26.77 | | | 8031 |
| Less gross margin Ewes @ $26.37 | | | 7911 |
| Net Benefit | | **(B)** | **120** |
| **Return on capital (B)/(A)*100** | | | **2%** |

**Situation 3:**
Similar to situation 2 except the enterprise selected is a cashmere/capretto. 300 does will replace 230 merino ewes. Cost of capital improvements is $6000.

| | | | |
|---|---|---|---|
| Capital purchase costs | | | $ |
| 300 does @ $22 | | | 6600 |
| 6 bucks @ $300 | | | 1800 |
| Capital improvements | | | 6000 |
| | | | **14400** |
| Less sale of ewes @ $20 | 4600 | | |
| Less sale of rams | 460 | | |
| | | | **5060** |
| Net cost of changeover | | **(A)** | **9340** |
| Gross margin does @ $29.80 | | | 8940 |
| Less gross margin Ewes @ $26.37 | | | 6067 |
| Net Benefit | | **(B)** | **2873** |
| **Return on capital (B)/(A)*100** | | | **31%** |

**Situation 4:**
Cashmere does to be used to replace 100 beef breeders producing yearlings. Capital required for improvements $50,000. Remaining 200 breeders are estimated to improve gross margin by $10 per head. Saving in weed costs $2000.

| | | | |
|---|---|---|---|
| Capital purchase costs | | | $ |
| 630 does @ $22 | | | 13860 |
| 6 bucks @ $300 | | | 1800 |
| Capital improvements | | | 40000 |
| | | | **55660** |
| Less sale of cows & bulls | 51600 | | |
| Cost of changeover | | **(A)** | **4060** |
| Gross margin does @ $26.77 | | | 16865 |
| Less GM cattle @ $213 | | | 21300 |
| plus improvement in GM/hd @ $10 | 2000 | | |
| plus savings in weed control costs | 2000 | | |
| Net Benefit | | **(B)** | **-435** |
| **Return on capital (B)/(A)*100** | | | **-11%** |