# DECIDE AND THRIVE

*Beef producers in Southern Australia*
*#1 of 4*

**Decide and Thrive** helps producers and consultants determine which breeders to cull during drought.

## Problem

When managing for drought, producers are faced with decisions about:

- when and how many animals to sell; and
- if selling breeders, which attributes are best to use for culling decisions.

**Decide and Thrive** addresses the question of which breeders to cull.

## Approach

Modelling was supported by commercial data to tackle the scenario of a severe drought where 50% of the herd needs to be culled to meet forage supply.

Step 1: sell all steers; dry and cast for age cows; 10% of heifers on physical confirmation.

Step 2: sell breeders at weaning based on either: lower body condition score, lower mature weight, greater age, or at random.

Step 3: rebuild the herd by retaining heifers and culling breeders at an older age.

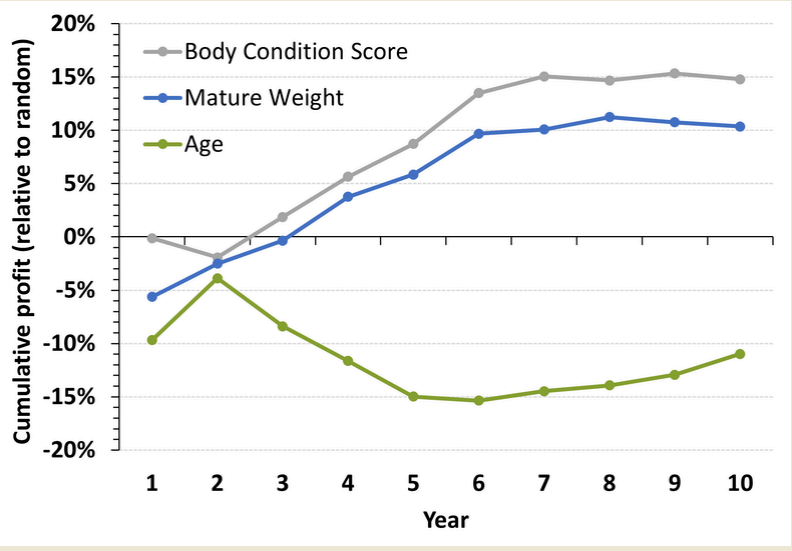


Fig 1: Cumulative profitability over a 10-year period (relative to random) from culling on body condition score, mature weight, or age.

## Analysis

- Hundreds of simulations of the model using a 10-year period with the chance of good and dry years based on historic climate.
- Variable and overhead costs based on industry data.
- Prices for inputs and outputs adjusted for drought and inflation.
- Weaning rate (82%) and mortality (5% p.a. for cows 2-10 years and 10% p.a. for older cows).
- Culling occurs in the first year and feeding when required thereafter.
- Estimate profitability from weight and price for cows, heifers, and steers sold and supplement fed.

## Key findings

- The most profitable outcomes were achieved using body condition score to cull breeders in response to drought.
- Producers would be about $150/hectare better off over a 10-year period from using body condition score, due to benefits of less feeding and higher weaning rates.
- Profit relative to random culling varies from year to year but producers would be better off approximately 60% of the time by using cow condition as the basis for culling.

Other factors known by producers and consultants are useful in determining which breeders to cull in response to severe drought and can be used in conjunction with these findings.

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# DECIDE AND THRIVE

*Beef producers in Southern Australia*
*#2 of 4*

**Decide and Thrive** helps producers and consultants decide which breeders to cull during drought.

## Which breeders to cull in drought

The first Fact Sheet (#1) identified that body condition score, followed by mature weight, were the most profitable approaches for culling breeders in response to drought.

## Approach to culling

The modelling tackled a scenario of a severe drought where 50% of the herd was culled to meet forage supply. Your experience and a feed budget will decide how many breeders to cull in response to drought.

## *Putting it into practice*

### Body condition score

**Step 1:** Identify the number of breeders to cull and convert this to a percentage. For example, culling 100 out of 500 breeders is a 20% cull.

**Step 2:** Determine the condition score of 20 breeders using industry 1-6 scoring standard (see weblinks in righthand column), to estimate the average condition score of the mob.

**Step 3:** Use the look-up table (Fig 1) as a condition score cut-off guide for culling. For example, if the mob average condition score was 3 and you were culling 30% of breeders, culls would have a condition score of 2.7 and below.

*NOTE: First and second-calf breeders will have a cut-off value 0.2 less than for older cows. For example, if the cut-off value for cows was 2.7, these younger breeders would have a cut-off condition score of 2.5.*

### Mature weight

**Step 1:** Is the same as for body condition score.

**Step 2:** Determine the live weight of 20 breeders to estimate the average weight of the mob.

**Step 3:** Use the look-up table (Fig 2) as a live weight cut-off guide. For example, if the mob average weight was 600 kg and you were culling 30% of breeders, those culls would weigh 550 kg and below.

*NOTE: First-calf breeders (heifers) will have a cut-off value 40 kg less than for older cows, and second-calf breeders a cut-off of 15 kg less. For example, if the cut-off value for cows was 550 kg, these younger breeders would have a cut-off live weight of 510 and 535 kg respectively.*

| Mob average Body condition score (1-6) | Breeder culling (%) 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|
| 2.0 | 1.2 | 1.5 | 1.7 | 1.8 | 2.0 |
| 2.2 | 1.4 | 1.7 | 1.9 | 2.0 | 2.2 |
| 2.4 | 1.6 | 1.9 | 2.1 | 2.2 | 2.4 |
| 2.6 | 1.8 | 2.1 | 2.3 | 2.4 | 2.6 |
| 2.8 | 2.0 | 2.3 | 2.5 | 2.6 | 2.8 |
| 3.0 | 2.2 | 2.5 | 2.7 | 2.8 | 3.0 |
| 3.2 | 2.4 | 2.7 | 2.9 | 3.0 | 3.2 |
| 3.4 | 2.6 | 2.9 | 3.1 | 3.2 | 3.4 |

Fig 1: Look-up table of body condition scores dependent on mob average condition score and culling percentage.

| Mob average Live weight (kg) | Breeder culling (%) 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|
| 400 | 270 | 320 | 350 | 380 | 400 |
| 450 | 320 | 370 | 400 | 430 | 450 |
| 500 | 370 | 420 | 450 | 480 | 500 |
| 550 | 420 | 470 | 500 | 530 | 550 |
| 600 | 470 | 520 | 550 | 580 | 600 |
| 650 | 520 | 570 | 600 | 630 | 650 |
| 700 | 570 | 620 | 650 | 680 | 700 |

Fig 2: Look-up table of mature live weights, dependent on mob average weight and culling percentage.

## Considerations

- Users of this Fact Sheet are encouraged to seek professional advice if early weaning is required.
- The body condition score and live weight values in the look-up tables are derived from industry data and provided for guidance; cut-off values may vary within a particular herd.
- Condition scoring information can be found via BREEDPLAN – https://bit.ly/4o3AKY4

and Agriculture Victoria – https://bit.ly/473u59x

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# DECIDE AND THRIVE

*Beef producers in Southern Australia*
*#3 of 4*

**Decide and Thrive** helps producers and consultants decide which breeders to cull during drought.

## Which breeders to cull in drought

- The first Fact Sheet (#1) in this series identified that body condition score, followed by mature weight, were the most profitable approaches for culling breeders in response to drought.
- The second Fact Sheet (#2) described how to put breeder culling into practice.
- This Fact Sheet (#3) describes the likely changes you can expect in the herd over time from culling of breeders in response to drought.

## Approach to culling

The modelling tackled a scenario of a severe drought where 50% of the herd was culled to meet forage supply. The herd was then rebuilt by retaining heifers and culling breeders at an older age. See Fact Sheet #1 for details about the modelling.

## Key findings

- Culling the lowest body condition score breeders led to an average herd with an initial advantage of 0.25 units condition score, 7.5 kg mature weight, and 3.9% points weaning rate compared to culling at random. By Year 10, the advantage was 0.1 units condition score, 3.5 kg mature weight and 1% points for weaning rate.

- Culling the breeders with the lowest mature weight led to an average herd with an initial advantage of 0.1 units condition score, 39 kg mature weight and 3% points weaning rate compared to culling at random. By Year 10, the advantage was 0.05 units condition score, 16 kg mature weight and 0.7% points for weaning rate.

- The initial increase in condition score and mature weight was a direct response to breeder culling. The following decline in the initial improvement comes from little selection on replacement heifers because most need to be kept to rebuild the herd.

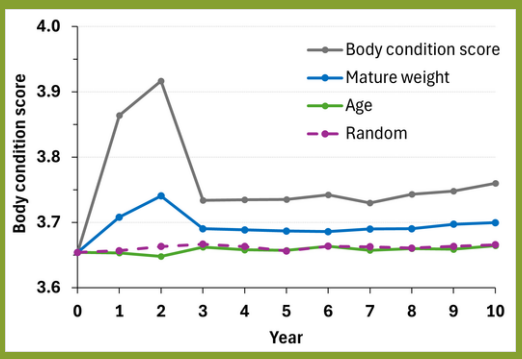


Fig 1: Response in body condition score from using different traits for culling of breeders in response to drought in Year 1.

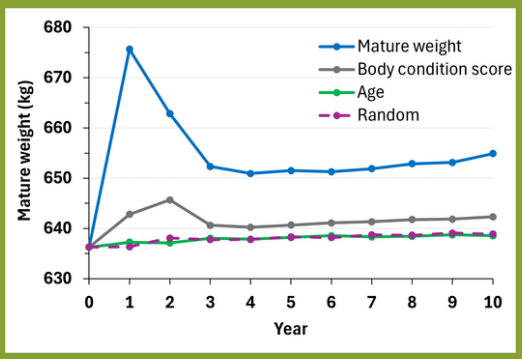


Fig 2: Response in mature weight from using different traits for culling of breeders in response to drought in Year 1.

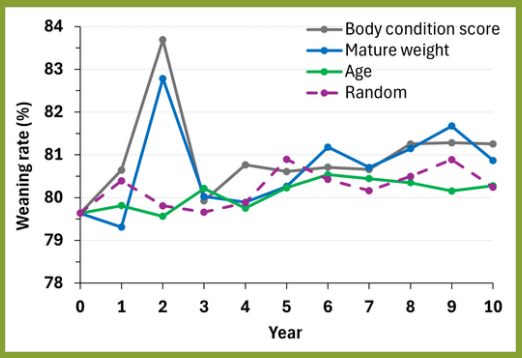


Fig 3: Response in weaning rate from using different traits for culling of breeders in response to drought in Year 1.

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# DECIDE AND THRIVE

*Southern beef producers Selling or feeding in response to drought #4 of 4*

**Decide and Thrive** helps producers and consultants decide which breeders to cull during drought.

## Introduction

Decisions about selling or feeding breeders when managing drought are complex and should be part of an overall management plan that also includes amongst a range of subjects:

- Restocking—so stocking rate matches carrying capacity, feed and financial budgets at the earliest possibility.
- Biosecurity—risks associated with purchased feeds and livestock.
- Feeding and water infrastructure and labour availability.

## Selling or feeding case study

Using the modelling described in Fact Sheet #1, the financial consequences from selling or feeding breeders were explored for three options:

1. Not selling breeders and feeding in response to drought.
2. Culling 50% of breeders in response to drought, feeding the remaining livestock, and rebuilding the herd over time through retention of heifers and keeping cows to an older age.
3. Culling 50% of breeders in response to drought, feeding the remaining livestock, and buying back-in (may refer to the most appropriate enterprise, e.g. breeders, trade stock, agistment, cropping, etc) at the earliest possibility, depending on feed and financial budgets.

In the Case Study, the annual stocking rate was 13 Dry Sheep Equivalent (DSE)/ha. Prices for livestock and feed, and overhead costs are from industry sources but these may differ from your situation[#].

## Take home messages

In this Case Study, when breeders were sold in response to drought, restoring the livestock inventory so that stocking rate matched carrying capacity, feed and financial budgets at the earliest possibility was more profitable than rebuilding the herd through breeding, or not selling and feeding.

Overall management plans for drought are complex and need to include, amongst a range of subjects, decision processes about:

- selling or feeding breeders in response to drought,
- restocking, so stocking rate matches carrying capacity, feed and financial budgets at the earliest possibility. In some situations, other enterprises, e.g. agistment, cropping, etc may be an alternative,
- biosecurity risks associated with purchased feeds and livestock,
- feeding and water infrastructure and labour availability.

- **The first Fact Sheet (#1) in this series identifies the most profitable approaches for culling breeders in response to drought.**
- **The second Fact Sheet (#2) identifies threshold trait values for culling breeders.**
- **The third Fact Sheet (#3) describes the likely changes in herds.**
- **This Fact Sheet (#4) identifies key points to consider when deciding whether to sell or feed breeders in response to drought.**

*# Meat and Livestock Australia, Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), Australian Wool Exchange, Jumbuck Agriculture, The Australian Beef Report - Bush Agribusiness PTY LTD, Livestock Farm Monitor Project - Agriculture Victoria.*

**In brief, nominal prices in the Case Study *during* and *following* drought were respectively:**

- **$2.98 and $3.44 ($/kg lwt) for cows,**
- **$313 and $260/tonne for hay.**

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# DECIDE AND THRIVE

*Southern beef producers Selling or feeding in response to drought #4 of 4*

**Decide and Thrive** helps producers and consultants decide which breeders to cull during drought.

## Key findings

The major points to consider in the decision of whether to sell or feed breeders in response to drought are:

### Gross income and costs

- Selling breeders increased gross income (Fig 1) and reduced costs (Fig 2) in Year 1, but herd rebuilding was typically slow. This resulted in lower gross income in the following years.
- Feeding breeders increased costs (Fig 2). In this Case Study, feeding increased costs by about $700/ha in the year of drought. But a larger herd size resulted in higher gross income in the following years than the option of selling and rebreeding.
- Selling breeders and then buying back-in, avoided the cost of feeding but shifted the cost increase, from stock purchases to the year after drought. In this Case Study, the cost of buying back-in was covered by sales in response to drought.
- Selling livestock led to an increase in the cost per head, because those overhead costs were fixed regardless of changes in livestock number.

### Livestock inventory

- Selling livestock reduced the value of the livestock inventory (Fig 3) and delays in restoring the livestock inventory, so that stocking rate matches carrying capacity, feed and financial budgets at the earliest possibility, will have a negative impact on profitability.

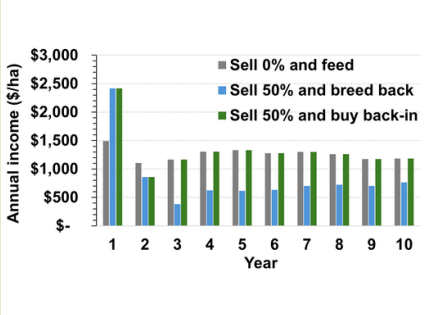


Fig 1: Annual gross income from: not selling breeders and feeding in response to drought, or selling 50% of breeders and breeding back, or selling 50% of breeders and buying back in Year 2.

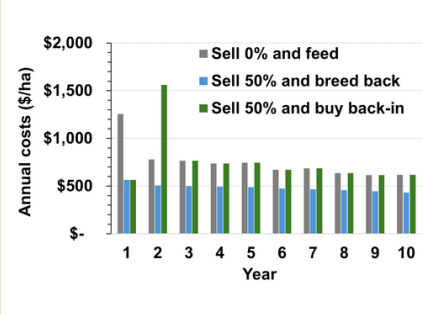


Fig 2: Annual costs (variable + overhead) from: not selling breeders and feeding in response to drought, or selling 50% of breeders and breeding back, or selling 50% of breeders and buying back in Year 2.

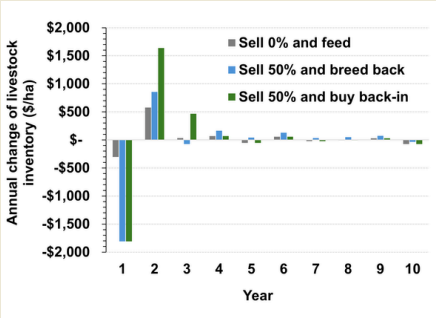


Fig 3: Annual change in the value of livestock inventory from: not selling breeders and feeding in response to drought, or selling 50% of breeders and breeding back, or selling 50% of breeders and buying back in Year 2.

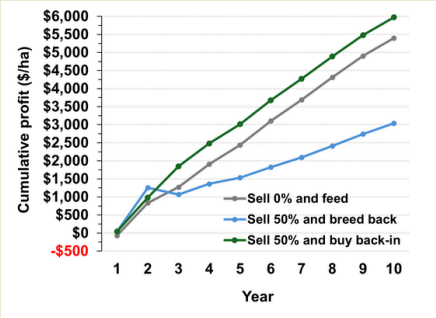


Fig 4: Cumulative profit (before interest and tax) from: not selling breeders and feeding in response to drought, or selling 50% of breeders and breeding back, or selling 50% of breeders and buying back in Year 2.

### Profitability

- In the short-term, profit was better for the option of selling and breeding back, but this changed from Year 3, because a smaller herd from breeding back meant less income, higher overhead costs per head, and therefore less profit.
- The option of not selling and feeding breeders, became more profitable than selling and breeding back, from Year 3, but required the capacity of the business to finance the increased costs due to feeding during drought.
- Selling breeders and buying back-in, was the most profitable option because it avoided the costs of feeding and rebuilt the herd in Year 2 through stock purchases.

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