

## Developing an effective breeding plan for your beef business

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This Primefact provides an overview of the important steps in designing and implementing an effective breeding program for your beef herd. It discusses the importance of establishing well defined breeding goals, a clear understanding of the requirements of the market(s) being targeted, and a good knowledge of the available differences in economically important traits both between and within breeds. It will show that the key elements to success in any breeding program are careful long-term planning, the use of good information to help in decision-making, and, above all, consistency and patience in the pursuit of breeding goals.

Table 1 summarises the key steps in planning and implementing a successful breeding program. These steps are no different from those used for any other investment decision in your beef enterprise.

You need to develop a clearly defined plan of what you are attempting to achieve from your investment in breeding. Once you have developed this plan you need to make informed decisions that consider the costs, the expected returns and the level of risk associated with the investment.

*Table 1. A stepwise approach to planning and implementing a successful breeding program*

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- Step 1.* List the traits of economic importance
  - Step 2.* List your future customers' requirements
  - Step 3.* List your future herd production targets
  - Step 4.* List your herd's current performance
  - Step 5.* List your breeding goals
  - Step 6.* Choose an appropriate breeding system to achieve your goals
  - Step 7.* List your criteria for selecting replacement bulls
  - Step 8.* Prioritise the selection criteria
  - Step 9.* Apply patience and consistency in implementing your breeding program
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*It is important to have a clearly defined plan for your breeding herd Photo: Bill Hoffman*



The important components of each of the steps in Table 1 are discussed below.

### **Step 1. List the traits of economic importance**

List those traits of genuine economic importance to your customers and/or your herd's future productivity. This will include traits influencing reproductive performance, growth, carcass yield and meat quality. You may also wish to include traits such as temperament and structural soundness.

Unfortunately, many breeders still pay undue attention to aesthetic or fashionable characteristics that contribute little real economic value to the future productivity of their herds. It is important for breeders to understand that the long-term economic viability of their beef enterprises depends on continual improvement of productivity. This means focusing on traits that will either lower the costs of production or increase the value and quantity of output from the herd.

### **Step 2. List your future customers' requirements**

Remember that the breeding for **today** is already done. Your breeding goals should relate to your vision of the likely **future** production environment and future customer requirements in at least 3 to 5 years' time. That's when the results of your current breeding decisions will be realised.

Clearly, it is impossible to be definite about future market opportunities, but careful analysis of market forecasts and trends in consumer demand can provide some 'best-bet' insights into likely future customer requirements.

Because of the uncertainty of predicting future market opportunities it is important that your breeding objectives are designed to ensure that future generations of progeny have a high degree of versatility and the ability to match a range of production and market situations.

The wide array of market specifications makes it extremely difficult, if not impossible, to produce an animal that is ideal for all situations. You should define a particular market as your primary target and focus mainly in that direction.

### **Step 3. List your future herd production targets**

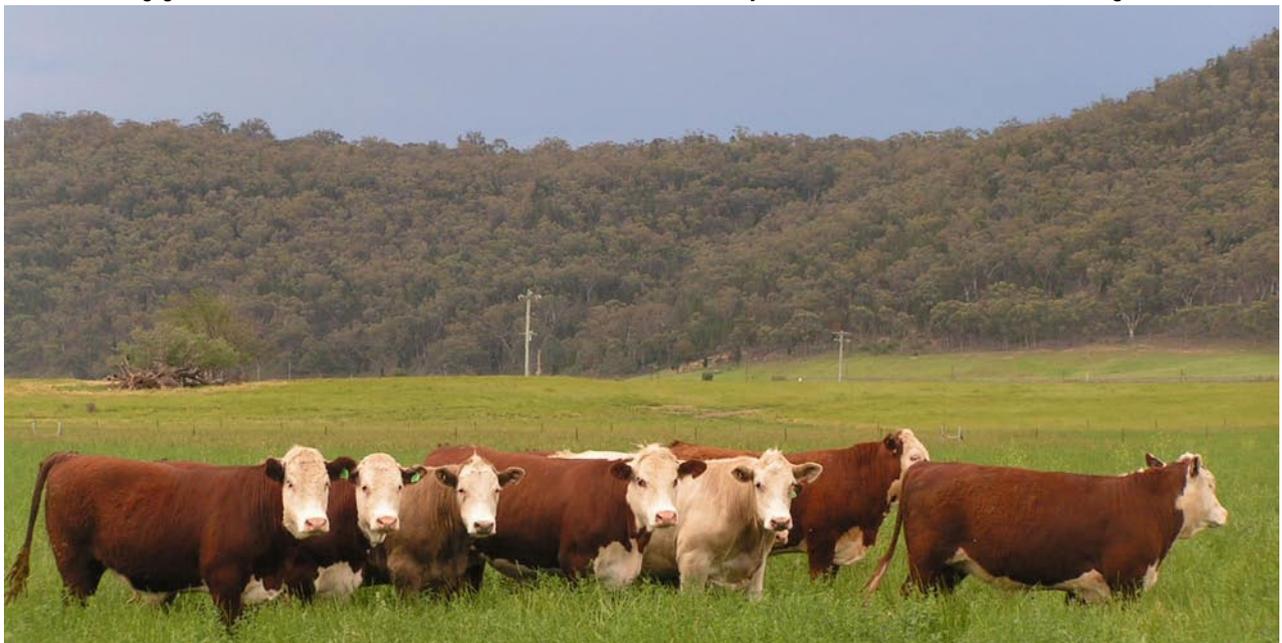
To optimise the use of the land and feed resources allocated to your cattle enterprise it is important to set realistic targets for weaning rates, calving spread, turn-off weights etc.

This may require an investigation of the typical production levels achieved by other producers in your region. Don't be too conservative. It is a good practice to set targets for your herd that are at least as good as, or better than, the average of the top 25 per cent of herds in your region.

### **Step 4. List your herd's current performance**

This is often the most difficult step in many situations. It requires knowledge of your current herd production levels (e.g. weaning rates, percentage of difficult calvings, turn-off weights), as well as feedback from your customers on the performance of your stock further along the production and marketing chain (e.g. growth rates during the backgrounding and finishing phases, carcass yield and meat quality).

*Your breeding goal should relate to customer needs in at least 3 to 5 years' time. Photo: Brian Cumming*



Unless you have a good understanding of the base from which you are starting, it will be difficult to determine the direction in which you should be shifting your herd to achieve your future targets. If you haven't been collecting relevant production data and customer feedback information, then now is a good time to start!

### Step 5. List your breeding goals

By comparing your current performance levels with your future herd production targets and future customers' requirements, you can identify those traits that need to be emphasised in your selection and bull purchase decisions.

For example, if your customer feedback indicates that your steers tend to be too light, with excessive fat cover, then you need to select bulls with greater growth potential and increased leanness. If your calving rates are less than optimal for your environment, or your calving spread is too long, then you should be placing greater emphasis on female fertility and/or reducing the milk production potential of your cows to give them a better chance of re-breeding early in the joining season.

### Step 6. Choose an appropriate breeding system to achieve your goals

Once you have established your breeding goals you will be in a sound position to choose the most appropriate breeding system that best achieves progress towards improved profitability in your herd.

In some situations straightbreeding will be the best option. In other situations, crossbreeding or composite breeding can be utilised to achieve the benefits of breed complementarity and hybrid vigour.

Straightbreeding—the use of a single breed in your breeding program—has the advantages of being a much simpler system to implement in a self-replacing herd. The major breeding decisions in straightbreeding systems are the choice of replacement sires and deciding which sires to join with which cows. You do not have the challenge of sourcing suitable replacement females or managing separate mating groups, as is required in some crossbreeding systems. Of course, the disadvantage of straightbreeding is that you forego the potential benefits of hybrid vigour and breed complementarity that can be achieved from a structured crossbreeding program.

**Crossbreeding** is practiced by many breeders in an attempt to increase performance over that achievable from the use of purebreds. This increase in performance, known as **hybrid vigour**, is generally most noticeable in traits such as fertility



*Choose the best breeding system to improve herd profitability. Photo: Bill Hoffman*

and survivability, but it can also be expressed in growth and carcass traits. For further information on crossbreeding refer to Primefact 624 *Beef cattle breeding systems*.

### Step 7. List your criteria for selecting replacement bulls

Once you have determined your breeding goals and the most appropriate breeding system for your situation, the next step is to list the relevant selection criteria that are available to help meet these goals.

For many of the important economic traits in most breeds there are GROUP BREEDPLAN Estimated Breeding Values (EBVs) available to help you rank potential candidate animals for selection. For example, if one of your breeding objectives is to reduce the incidence of calving difficulties in your herd, then relevant selection criteria include EBVs for Birth Weight and Calving Ease. If your breeding goal is to increase marbling performance, then

*Selection for structural soundness, temperament and 'maturity pattern' requires skilled judgment. Photo: Brett Littler*



the relevant selection criteria will include EBVs for Intramuscular Fat Percentage. For further information on the use of EBVs refer to Primefact 625 *Using EBVs and \$Index Values in beef breeding*.

Unfortunately, not all economically important traits have objective measurements available. Selection for structural soundness, temperament and 'maturity pattern' still requires visual assessment and skilled judgment.

When you list your selection criteria, remember that the more traits you select for the less progress you are likely to make for any particular trait. Although single-trait selection is rarely an optimal breeding strategy, it is just as important not to try to incorporate too many traits into your selection program. It is important that each selection criteria is related to a breeding goal that has real economic importance.

### **Step 8. Prioritise the selection criteria**

In most cases, there will be several traits identified as requiring some emphasis in your breeding program. Once you have identified the relevant selection criteria it is important to establish their relative importance. This will require some knowledge of the scope for genetic improvement of the various traits, the genetic relationships between traits (both favorable and antagonistic) and the relative economic importance of genetic improvement in each trait.

When you are determining priorities for selection it is important to distinguish between the benefits of achieving gains in your current herd and those obtained from gains in future herd performance. The optimum balance between reproduction, growth and carcass traits to maximise profitability from the current herd will differ from the optimum balance for future herd profitability.

For example, because of the economic importance of maximising the number of live calves born, reproduction traits will usually demand greater emphasis when you are considering culling strategies for the current herd. However, after consideration of its low heritability and limited scope for genetic change, fertility usually commands less emphasis in selection to improve future profitability.

It is likely that the future trend towards value-based marketing and premiums for improved quality and consistency will increase the industry emphasis on end-product traits. Successful beef producers will need to plan carefully to balance this end-product emphasis with the need to maintain and improve on-farm productivity in their breeding herds.

### **Step 9. Apply patience and consistency in implementing your breeding program**

Lack of consistency in the pursuit of breeding goals has caused the downfall of many breeding programs. Breeders are often influenced by fads that may seem important at the time but have little long-term justification. They may alter their breeding programs to meet a fashion, only to find later that they have been wasting time or even going backwards.

It is important to stick to long-term goals unless there are legitimate reasons to alter the direction of a breeding program. Market changes, long-term changes to the production environment and the availability of new information and technologies are often valid reasons to reconsider long-term breeding goals.

Investment in your breeding program should be considered as a long-term strategy for improvement in herd profitability. There are certainly many alternative investment strategies that will generate faster returns than those obtained from investing in genetics. However, genetic improvement is one of the few investment options available to beef producers that can provide permanent cumulative long-term gains in herd performance and profitability.

The pace of genetic change is usually much slower than most of us would like. Because of the random nature of inheritance the short-term results of breeding decisions are necessarily unpredictable. Successful breeders patiently play the averages, assured that if they follow their long-term plans the average for the next generation of animals will be better than the last, and the generation after next even better. The influence of chance in breeding also creates opportunities. Occasionally, a truly outstanding animal is produced with the potential to provide a dramatic lift in the genetic merit of a population. Successful breeders are those who have the persistence and skill to seek and exploit the opportunities presented by genetic variation: they are patient opportunists.

### **Conclusion**

In most beef enterprises significant opportunities exist for using improved breeding programs to enhance long-term profitability. The beef industry is equipped with the knowledge and tools to make faster genetic progress than at any other time in history. Unfortunately, most beef producers will fail to obtain the full potential benefits from genetic improvement because of inadequate planning of their breeding objectives, inadequate use of available information to help in their breeding

decisions, and lack of patience and consistency in implementing their breeding programs.

To fully benefit from genetic improvement it is essential to carefully plan the appropriate direction for your breeding program, and to persist with a long-term strategy to pursue this direction in the face of short- and medium-term challenges to your enterprise.

### **Further reading**

Primefact 249 *Checking your bull is ready for joining*

Primefact 621 *Market specifications for beef cattle*

Primefact 622 *Live beef cattle assessment*

Primefact 623 *Cattle breed types*

Primefact 624 *Beef cattle breeding systems*

Primefact 625 *Using EBVs and \$ Index Values in beef breeding*

Primefact 626 *Selecting and managing beef heifers*

Primefact 627 *Economic advantages of better management of your beef breeding herd*

### **Further information**

For further information contact your local NSW Department of Primary Industries Livestock Officer (Beef Products).

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