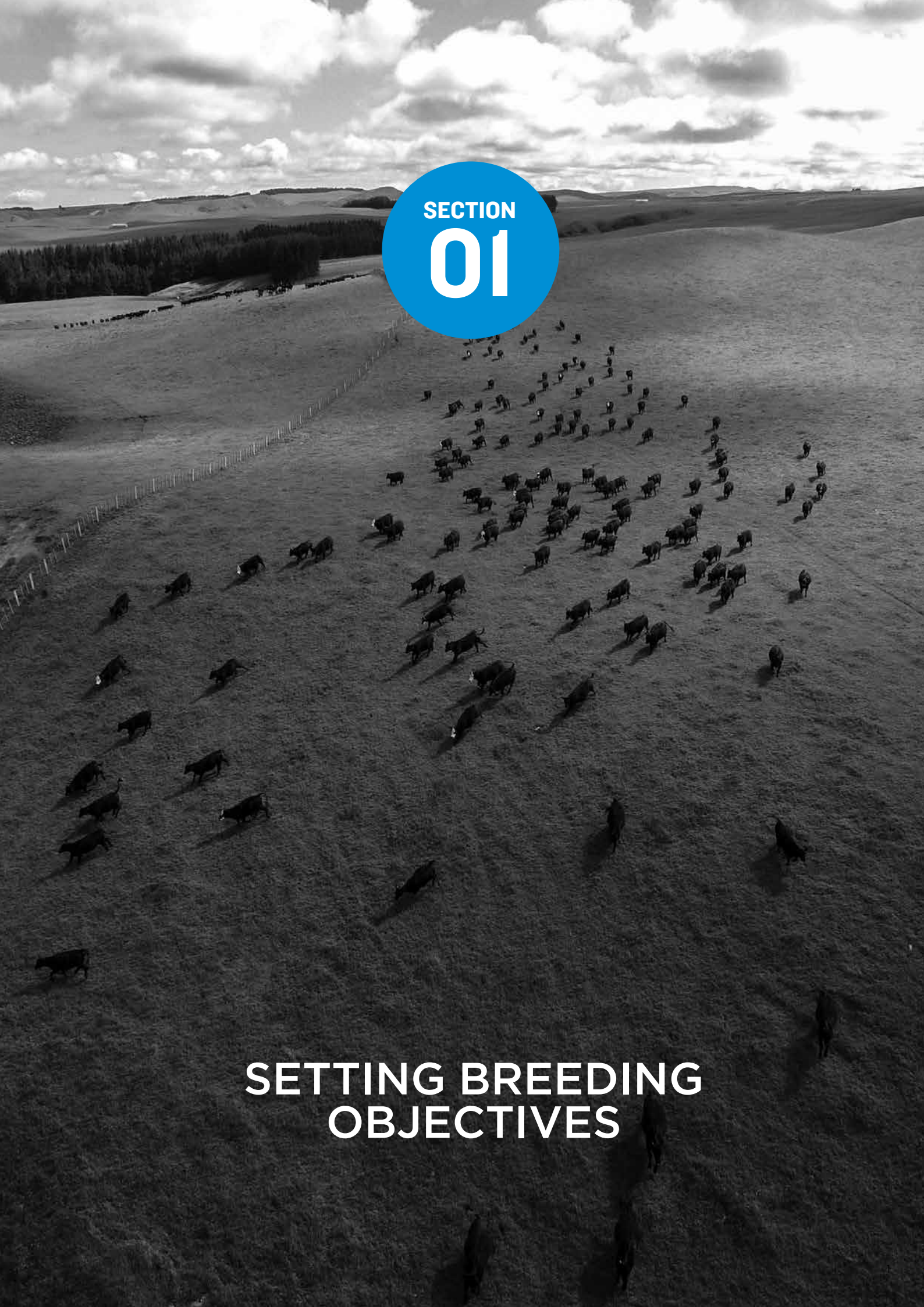


SECTION
01

SETTING BREEDING OBJECTIVES

Which traits contribute to production and profitability? What emphasis should you place on each trait when selecting breeding stock?

Setting a breeding objective can be as simple as choosing a breed, or more sophisticated such as increasing weaning weight.

It is easier to make more progress in fewer traits than it is in many traits all at once. Likewise, it is easier to make faster progress in traits that are highly heritable. Keeping this in mind, a good breeding objective is simple but achievable, and it can be measured. For example "I put the emphasis on 200-day growth breeding value when buying a bull and my average weaning weights lifted".

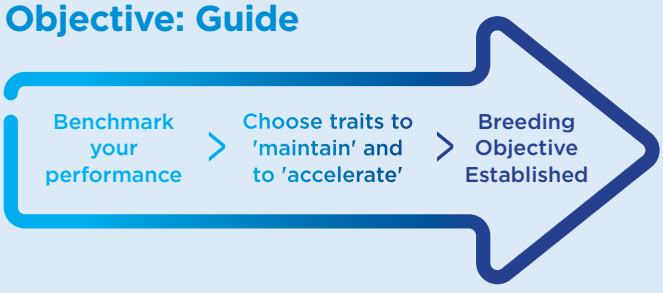
The relative importance of different traits varies from farm to farm. Breeding herds are going to focus on different traits, compared to finishing operations. The importance of traits and their profitability can vary over time, according to changes in the market.

Breeding objectives appropriate to market requirements are discussed below in two sections: one relates to the productivity of the breeding cow (maternal performance); the other to post-weaning performance (terminal performance).

Summary

- When choosing a bull, prioritise and choose traits that will allow you to improve your system's production.
- The maternal influence – as measured by weight of calf weaned per cow joined – is the most important consideration for the cow herd.
- Cow size should be optimal for your environment, while maximising calf growth.
- Growth rate and carcass yield remain the two most important characteristics of the processed animal.
- Carcass quality is rewarded with market premiums and should therefore be considered in bull selection.

Setting your Breeding Objective: Guide



Answer the questions in each trait group and consider your five year goal. Does it need improving? Are you happy with your current performance compared to the industry benchmarks? Answering the questions under each trait group will allow you to establish your Breeding Objective and set you on the track to finding the right breeder and the right bulls to achieve your goals.

The maternal environment

The maternal environment is all about the breeding cow and her effectiveness at weaning a good calf every year.

The most important financial driver for a breeding cow farmer is the number of calves weaned to the number of cows mated. This is at least twice as important as growth and carcass characteristics. The breeding cow needs to be able to do this every year with a low cost of input, while getting in-calf quickly, year after year.

Up to 80% of genetic gain is achieved through the bull. Why? Because a bull is mated to 30-50 cows per year, so bulls can be selected much more intensely (you need fewer of them).

Reproduction

Reproductive performance is complex because it involves the cow getting in-calf at the planned time each year (preferably starting at 15 months of age) and producing a live calf which thrives through to weaning and beyond. Cows that get in-calf early are more fertile and wean heavier calves, giving them a higher value in the herd.

Good reproductive performance is of high economic importance, but its heritability is low, so it is slow to improve genetically. The environment has a large part to play in reproductive performance. Cow management, animal health, seasonality all creates a lot of variation, masking the influence (on reproductive performance) of genetics alone. New Zealand's national calving percentage has not changed for several years and experts believe genetics has a role to play in lifting percentages.

Culling cows which fail to breed or wean calves will improve the cow reproductive efficiency of your herd, but only moderately. Similarly, good management can help to improve reproductive performance. However the best tool available is **good bull selection**.

Mating heifers to calve at two years of age is a valuable way to improve reproductive efficiency, by rearing a calf when that heifer would otherwise be dry. It also reduces the interval between generations which leads to more rapid genetic improvement.

Reproduction

What is your average scanning percentage?
(% females conceived on exposure to bull)

.....

What is your five year goal?

.....

Industry benchmark: 93%

What is your average percentage of cows conceiving in the first cycle?
(% females conceived on exposure to bull - in first 21 days)

.....

What is your five year goal?

.....

Industry benchmark: 65%

Are you mating yearling heifers?

◯ Yes ◯ No

Industry benchmark: Yes (at 15 months)

Useful EBVs in bull selection:

- **Days to calving (DTC)** – a measure of calving interval. Cows that get in-calf early every year are more fertile and reproductive efficient. They also wean older, larger calves.
- **Rib fat (Rib Fat)** – related to increased heifer conception in that heifers with more rib fat at mating have an increased likelihood of conception. Like Scrotal size, it is a measure of heifer puberty and sexual maturity.
- **Scrotal size (SS)** – indicates bull maturity and is positively correlated to female fertility.

Mark on the line how you would describe your performance in reproduction

BELOW DESIRED | ACCEPTABLE | ABOVE DESIRED

Calving ease

A cow should calve unassisted. Having to assist a cow in giving birth is a health risk to the cow as well as being a labour cost. Cows who fail to calve unassisted should be culled.

What is your average percentage of assisted births in two year heifers?

.....

What is your five year goal?

.....

Industry benchmark: 3%

What is your average percentage of assisted births in mixed age cows?

.....

What is your five year goal?

.....

Industry benchmark: 1%

Useful EBVs in bull selection:

- **Calving ease direct (CED)** – is the ability of a sire's calves to be born unassisted.
- **Calving ease daughters (CEDtrs)** – the ability of a sire's daughters to calve at two years of age without assistance.
- **Gestation length (GL)** – the length of time from conception to calving. Longer GL's result in larger calves that may have calving difficulties.
- **Birth weight (BW)** – the weight of calf at birth. Heavy calves have an increased incidence of calving difficulties.

Mark on the line how you would describe your performance in calving ease

BELOW DESIRED | ACCEPTABLE | ABOVE DESIRED

Milk production (including mothering ability)

The simplest measure of a cow's mothering ability is the weight of its calf at weaning. It shows the calf's ability to grow and the dam's ability to care for it. But, to a large extent, it reflects the dam's milk production. Introducing dairy and dual purpose breeds to the breeding herd will progress milking ability.

Useful EBVs in bull selection are:

- **Milk (Milk)** – the amount of calf growth attributed to the cow.

There is evidence to suggest excessive milk production can result in decreased fertility. Cows that put a large amount of their energy into milking can fail to cycle and get in-calf at the time required. Body condition at mating is positively related to conception rate and this energy reserve can be spent when milking. Ultimately, milk/mothering ability should be optimised to accelerate calf growth and allow the cow to retain a fair condition.

Mark on the line how you would describe your performance in mothering ability

BELOW DESIRED | ACCEPTABLE | ABOVE DESIRED

Cow size

Moderate cows are more desirable on hill country. Larger cows are most likely to have higher maintenance costs and are more likely to cause soil damage. Keeping cow size moderate, while maximising growth, is the challenge. Increasing calf growth rate in your cow herd is expected to lift cow mature size. This, in turn, allows fewer cows to be run per hectare and therefore fewer calves are born in the herd annually – a key profit driver. This can reduce efficiency of the cow herd.

What is the average weight of cow in your herd?

.....

What is your five year goal?

.....

Industry benchmark: 530 kg cow (weaning 240 kg calf)

Useful EBVs in bull selection are:

- **Mature cow weight (MCW) –** weight of cow at three years or older.
- **600-day weight (600D)** – weight at 18 months.

Mark on the line how you would describe your performance in cow size

BELOW DESIRED | ACCEPTABLE | ABOVE DESIRED

Longevity

A cow which regularly produces good weaners over many years will be more profitable than a cow that leaves the herd early. A longer productive life increases financial return. However, younger females will be genetically superior, as a result of bull selection (based on your new breeding objective).

Post-weaning performance to slaughter

In the slaughter animal, the aim is to produce maximum kilograms of beef at the fastest rate whilst meeting market carcass specifications. However, carcass quality can reward finishers with premiums and should be considered a selection criterion.

Growth

Growth rate is the most important characteristic in the finishing animal. Most of the differences between animals in kilograms of meat produced are due to differing growth rates. With the predominant meat payment system in New Zealand being weight based, growth is the key economic driver. Growth rate can be easily measured in your herd.

What is your average weaning weight?

.....

What is your five year goal?

.....

Industry benchmark: 240 kg (at 7 months)

Useful EBVs in bull selection:

- **200 Day weight (200D)** – for calf growth to weaning.

What is your average mating weight (yearling heifers)?

.....

What is your five year goal?

.....

Industry benchmark: 300 kg

Useful EBVs in bull selection:

- **400 Day weight (400D)** – for growth to 12 months.

What is your average age at slaughter (steers bred on farm)?

.....

What is your five year goal?

.....

Industry benchmark: 18 months

Useful EBVs in bull selection:

- **400 Day weight (400D)** – for growth to 12 months.
- **600 Day weight (600D)** – for growth to 24 months.

Mark on the line how you would describe your performance in growth

BELOW DESIRED | ACCEPTABLE | ABOVE DESIRED

Carcass merit

For carcasses of a given weight, the quantity of saleable meat yield is the most important attribute. Carcasses must also have optimum fat deposition to avoid value deductions. Finally carcasses must achieve an Ultimate PH within the acceptable range – this is influenced by docility in bull selection and will also mean a carcass value deduction if isn't achieved.

What is your average carcass weight (steers bred on farm)?

.....

What is your five year goal?

.....

Industry benchmark: 300 kg

Useful EBVs in bull selection are:

- **Carcass weight (CW)** – to identify animals that will slaughter heavier relative to live weight.

What is your average Dressing out percentage?

.....

**Carcass weight as a percentage of live weight at slaughter*

What is your five year goal?

.....

Industry benchmark: 55%

Useful EBVs in bull selection are:

- **Retail beef yield (RBY)** – to identify animals with increased yield meat percentage of the carcass.

Are you seeing a significant percentage of animals not achieving an Ultimate PH < 5.8 at slaughter?

◯ Yes ◯ No

Industry benchmark: 5.8 < 5.3

Useful EBVs in bull selection are:

- **Docility** – quiet cattle at slaughter avoid dark cutting/high ultimate pH meat.

Are you struggling to finish animals or seeing a significant percentage of animals falling outside the Prime (P) fat grade at slaughter?

◯ Yes ◯ No

Industry benchmark: 3-12 mm rib fat

Useful EBVs in bull selection are:

- **Rib/rump fat** – select for optimum carcass fatness.

Mark on the line how you would describe your performance in carcass merit

Carcass quality

Carcass quality has an economic value in some markets and so can reward the breeder in the slaughter animal.

Ossification (maturity at slaughter), eye muscle area, meat colour, fat colour and marbling are common measures in premium quality rewarded beef programmes – on top of standard carcass merit measures.

Are you supplying a beef programme awarding premiums for carcass quality? ◯ Yes ◯ No

What is your average % hit rate for this programme?

.....

What is your five year goal?

.....

Are you seeing significant percentages of animals failing due to:

Marbling ◯ Yes ◯ No **Ossification** ◯ Yes ◯ No **Meat colour** ◯ Yes ◯ No

Fat colour ◯ Yes ◯ No **Eye muscle area** ◯ Yes ◯ No

Useful EBVs in bull selection are:

- **IMF** – to lift marbling score.
- **600 Day Weight (600D)** – to reduce age and or maturity at slaughter.
- **Docility** – quiet cattle at slaughter avoid dark cutting (colour)/low ultimate pH meat.
- **Eye muscle area (EMA)** – loin cuts are the most valuable and result in more high value meat on the animal.

Mark on the line how you would describe your performance in carcass quality

BELOW DESIRED — ACCEPTABLE — ABOVE DESIRED

Conformation

'Conformation' of an animal has a variety of interpretations. It is used to describe 'type' characteristics, conformity and structural soundness.

Animals must be structurally and reproductively sound. Selection should be made against defects that reduce the animal's ability to move freely, graze efficiently or reproduce. Assessment of soundness can be carried out using the Beef Class Structural assessment system (see Section 06).

Selection on conformity has a value – as animals of a similar maturity pattern or 'type' is more likely to be ready for slaughter at a similar time. This makes feed budgeting easier and the spread of kill narrower.

Selection on conformation should be directed towards animals showing increased muscularity and against animals showing fat outside the acceptable market level.

In the slaughter animal, coat colour and markings have little importance. Selection for colour can reduce the progress made in other traits of economic value. However, in some branded beef programmes, colour is awarded premiums, providing the correct identification is in place.

Mark on the line how you would describe your performance in Conformation

BELOW DESIRED — ACCEPTABLE — ABOVE DESIRED

Establishing your Breeding Objective (into traits)

Dependant on the current performance of your breeding programme, you may choose to 'emphasise' some traits and 'maintain' others.

1. List the trait groups (on farm) in which you are currently performing at a level below acceptable. These will make up the trait groups you need to focus on and 'emphasise'. Aim for four groups and list the traits; in order of economic and productive importance to your system.
2. Beneath each trait group, e.g. Reproductive performance, select the 'useful EBVs for bull selection' that are of most relevance to your current on farm performance.

Traits to Emphasise

Trait Group 1 .....

Focus EBVs .....

Trait Group 2 .....

Focus EBVs .....

Trait Group 3 .....

Focus EBVs .....

Trait Group 4 .....

Focus EBVs .....

3. In an order of economic and productive importance relative to your system, list the trait groups (on farm) in which you are currently performing at a level above desired.

These will make up the trait groups that aren't necessary to 'emphasise' but instead 'maintain'.

Note: *This doesn't mean these traits should be ignored and left to decline, but rather be maintained at an acceptable level i.e. maintain at breed average (see Section 03).*

4. Beneath each trait group select the 'useful EBVs for bull selection' that is of most relevance to your current on farm performance.

Traits to Maintain

Trait Group 1 .....

Focus EBVs .....

Trait Group 2 .....

Focus EBVs .....

Trait Group 3 .....

Focus EBVs .....

Trait Group 4 .....

Focus EBVs .....

Congratulations! You now have a Breeding Objective. These are the traits that are of more and less importance to your herd. Effective bull selection will occur from a bull breeder that has a similar breeding objective to your own and is recording these same traits of importance to you.