Australian Limousin Selection Indexes: Technical Specifications

The Australian Limousin Breeders' Society currently reports five different selection indexes. These are the:

- Domestic Maternal Index
- Export Maternal Index
- Northern Export Index
- Yearling Prime Index
- Dairy Beef Index

All of the selection indexes described above have been derived using BreedObject software. The BreedObject selection index development process involves four major steps. These steps are:

1. A detailed description of the input costs and value generation of the commercial herd and target production system.
2. Once the target production system is described, the BreedObject software evaluates how each trait influences profitability and the economic value of improving each trait.
3. The BreedObject software then assesses what emphasis needs to be applied to each Estimated Breeding Value (EBV) trait to achieve the maximum profitability in the production system and for the market end point for which that index was designed. This step includes evaluating the selection response expected from direct selection on the individual EBVs and the correlated responses expected from selection on related EBVs.
4. The importance placed on each EBV results in the selection index value that is calculated for each animal.

Each selection index describes a different production system/market scenario and relates to a typical commercial herd using Limousin bulls. As is the case for EBVs, each selection index can be used to rank and compare animals on their genetic merit. Producers are advised to use the selection index that most closely aligns to their production system. See the Using Australian Limousin Selection Indexes tip sheet, available in the Help Centre on the BREEDPLAN website, for further information on the identification and utilisation of the most applicable selection index for your herd.

All selection indexes are reported in units of net profitability per cow mated ($) for the production system/market scenario they describe. Selection indexes account for both sides of the profit equation (costs as well as income), and also reflect the relative short and long term profit associated with possible selection decisions. For example, short term profit can be generated by a bull through the sale of his progeny, and the longer term profit generated by his daughters in a self-replacing cow herd.

Each of the selection indexes are focused on efficient beef production while also targeting the following specifications:

Domestic Maternal Index - Estimates the genetic differences between animals in net profitability per cow joined for a typical self-replacing commercial herd targeting the domestic supermarket trade. Selected heifers are retained for breeding and so maternal traits are of importance. Steers and surplus heifers are finished on grass or a short fed grain program. Steers target 450 kg live weight (250 kg carcase weight & 8 mm P8 fat) and heifers 425 kg (235 kg carcase weight & 9 mm fat depth), at 15 months of age. In response to industry feedback; positive emphasis has been placed on the ability to meet MSA specifications.

Export Maternal Index - Estimates the genetic differences between animals in net profitability per cow joined for a typical self-replacing commercial herd targeting the heavy export trade. Selected heifers are retained for breeding and so maternal traits are of importance. Steers and surplus heifers are finished on grass or a short fed grain program. Steers target 560 kg live weight (330 kg carcase weight & 12 mm P8 fat) and heifers 525 kg (290 kg carcase weight & 14 mm fat depth), at 22 months of age. In response to industry feedback; positive emphasis has been placed on the ability to meet MSA specifications.

Northern Export Index - Estimates the genetic differences between animals in net profitability per cow joined for a typical commercial herd where Limousin bulls are joined with *Bos indicus* cows in Northern Australia targeting the export trade. This index assumes all progeny will be finished on grass. At market, steers target 580 kg live weight (330 kg HSCW and 12 mm P8 fat depth) and heifers 545 kg (300 kg HSCW and 14 mm P8 fat depth) at 27 months of age. In response to industry feedback, positive emphasis has been placed on finishing ability. This index can also be used by producers in Temperate Australia that are targeting larger carcase weights.

Yearling Prime Index - Estimates the genetic differences between animals in net profitability per cow joined for a typical commercial herd where Limousin bulls are joined with either British breed or dairy cows and targeting the domestic carcase trade. This index targets 365 kg live weight (200 kg HSCW & 5 mm P8 fat depth) progeny. In response to industry feedback; positive emphasis has been placed on the ability to meet MSA specifications.

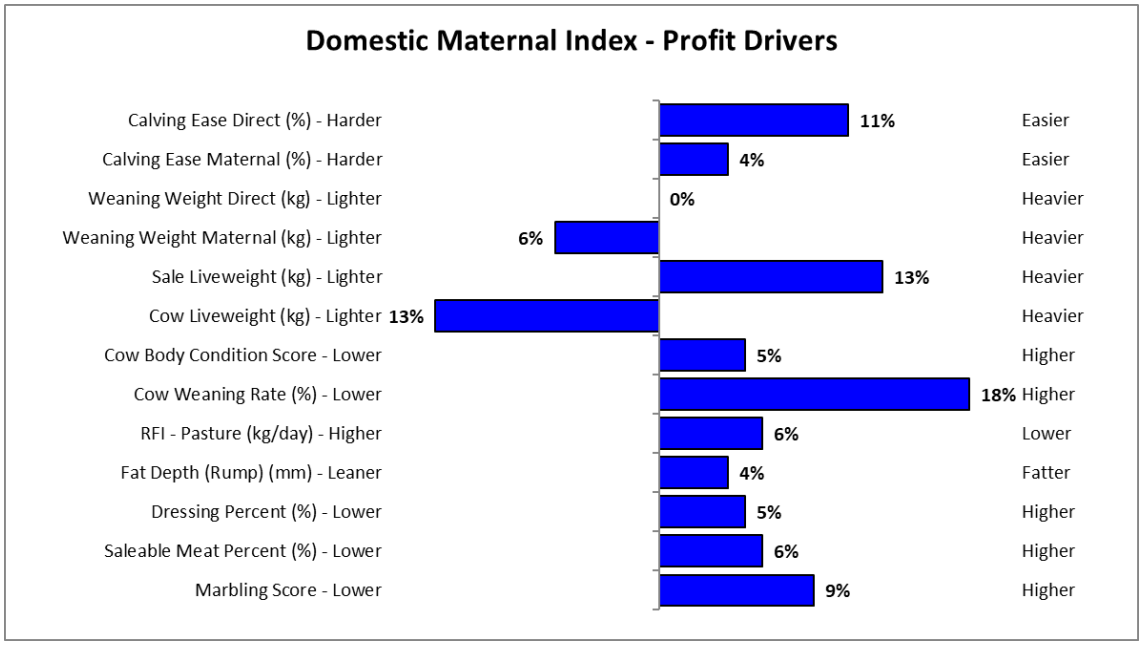
Dairy Beef Index - Estimates the genetic differences between animals in net profitability per cow joined for a typical commercial dairy cow herd using Limousin bulls to produce Dairy Beef for the domestic carcase trade. All progeny are to be marketed and target 415 kg live weight (225 kg HSCW & 8 mm P8 fat depth) at 17 months of age. In response to industry feedback; positive emphasis has been placed on the ability to meet MSA specifications with high calving ease and short gestation.

More detailed information regarding each selection index is provided on the following pages.

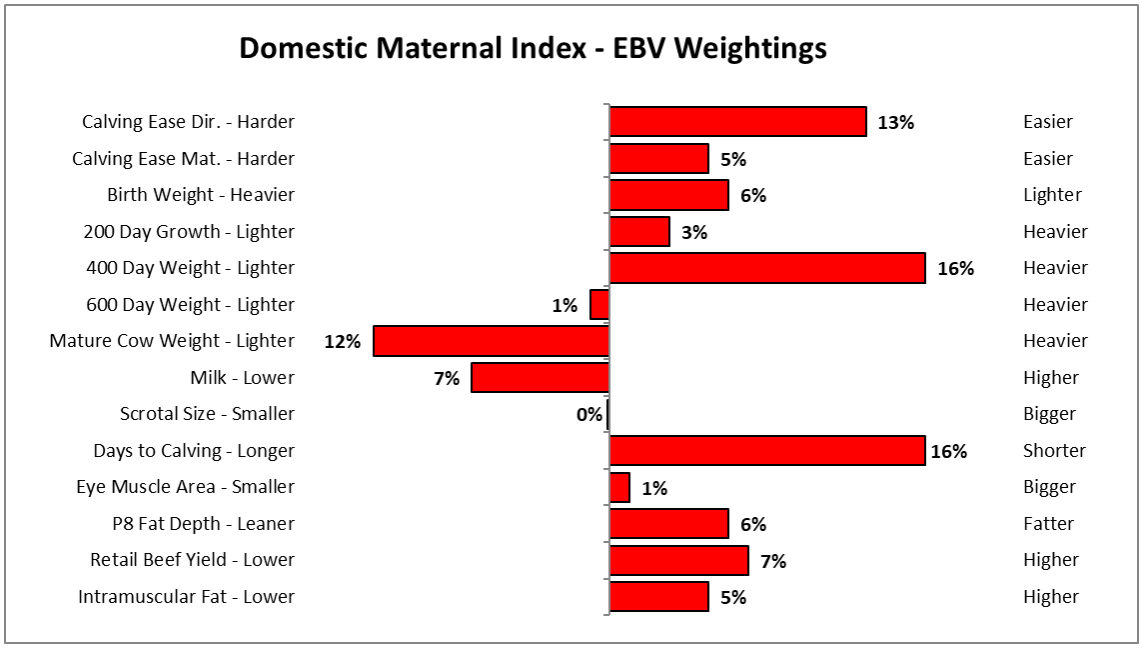
If you have any further queries regarding the Australian Limousin Selection Indexes, please do not hesitate to contact staff at your BREEDPLAN processing centre.

Domestic Maternal Index

The following bar graph shows the **key economic traits**, as determined by the BreedObject software, that are important in this selection index. The different trait emphases reflect the **underlying profit drivers in a commercial operation** targeting the described production system/market.

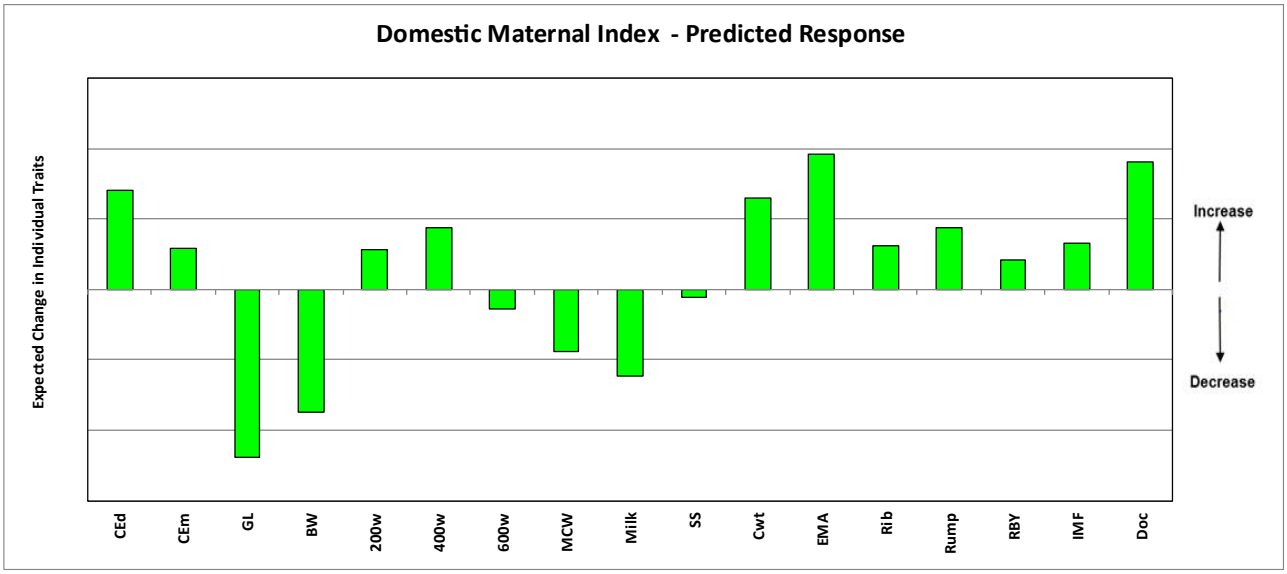


The bar graph below illustrates the magnitude and direction of emphasis that has been placed on each **BREEDPLAN EBV** within this selection index. These weightings represent the **most profitable combination of EBVs**, as determined by the BreedObject software, for the described production system/market.



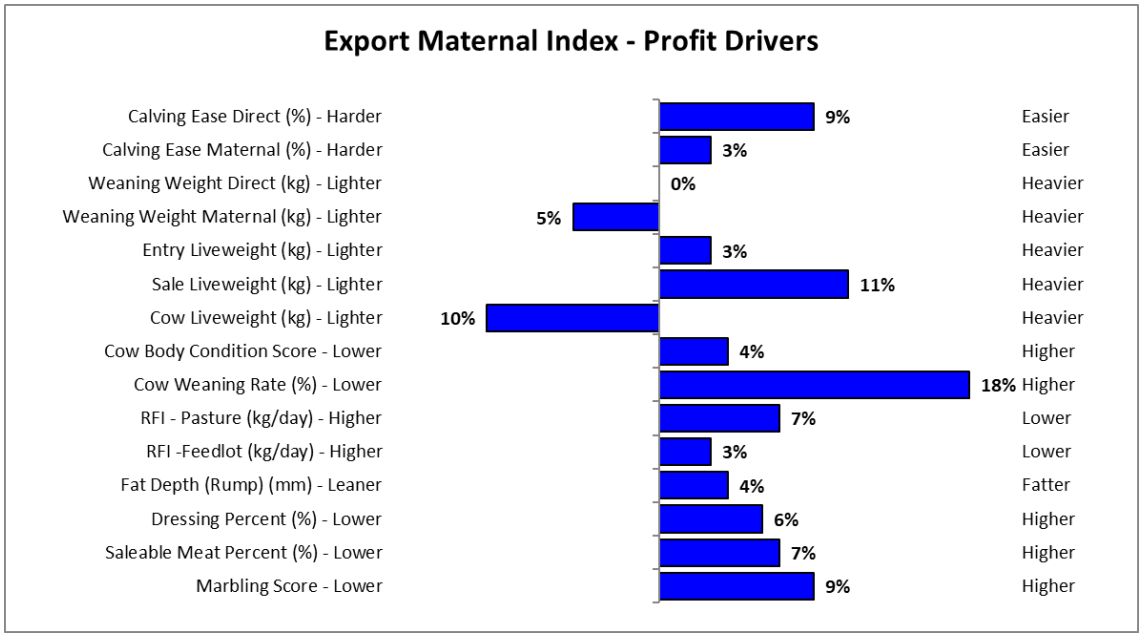
While the graphs on the previous page show the emphasis that has been placed on the production traits and each EBV within the Domestic Maternal Index, they do not reflect the expected change that will occur to each individual EBV if producers select animals using this selection index. The selection response will also be influenced by factors such as the genetic relationship between traits and the animals that are available for selection. For example, while there is a negative weighting on 600 Day Weight in this selection index, it would be expected that growth to 600 days would typically increase due to the large positive weighting on 400 Day Weight, and the strong genetic correlation between the two traits.

The following bar graph provides an indication of the **relative change** that would be expected in each individual BREEDPLAN EBV if producers select animals using the Domestic Maternal Index. The graph reflects the relative change if the Limousin Published Sires in 2024 were ranked on this selection index and the Top 10% **selected for use within a breeding program**. The response to selection may differ if a different group of animals were available for selection.

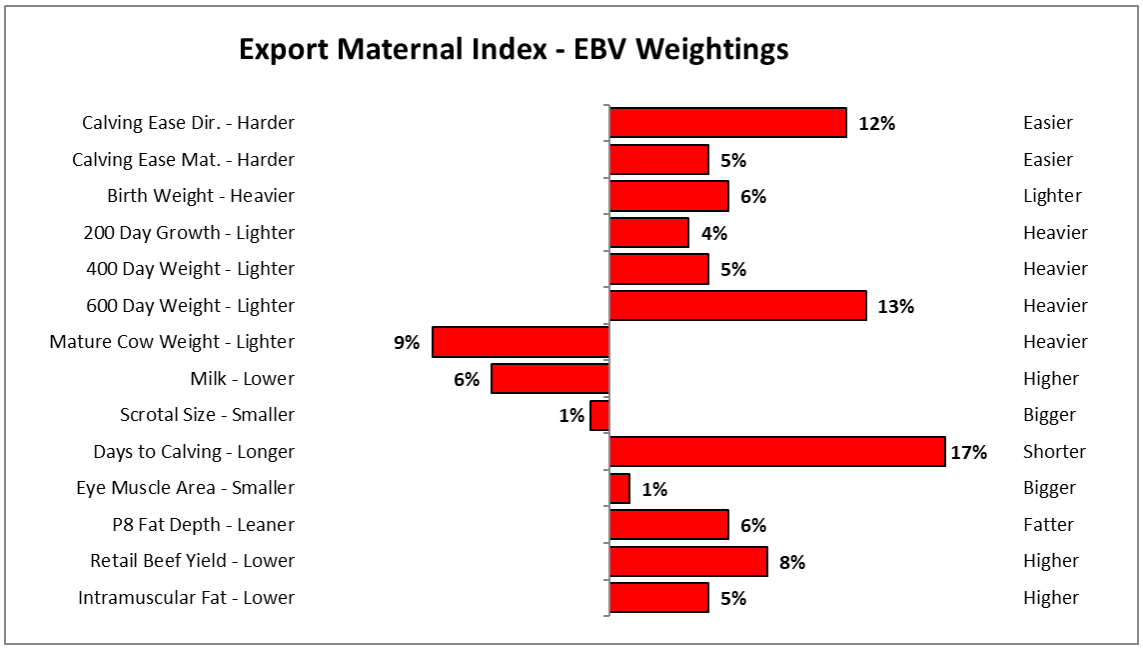


Export Maternal Index

The following bar graph shows the **key economic traits**, as determined by the BreedObject software, that are important in this selection index. The different trait emphases reflect the **underlying profit drivers in a commercial operation** targeting the described production system/market.

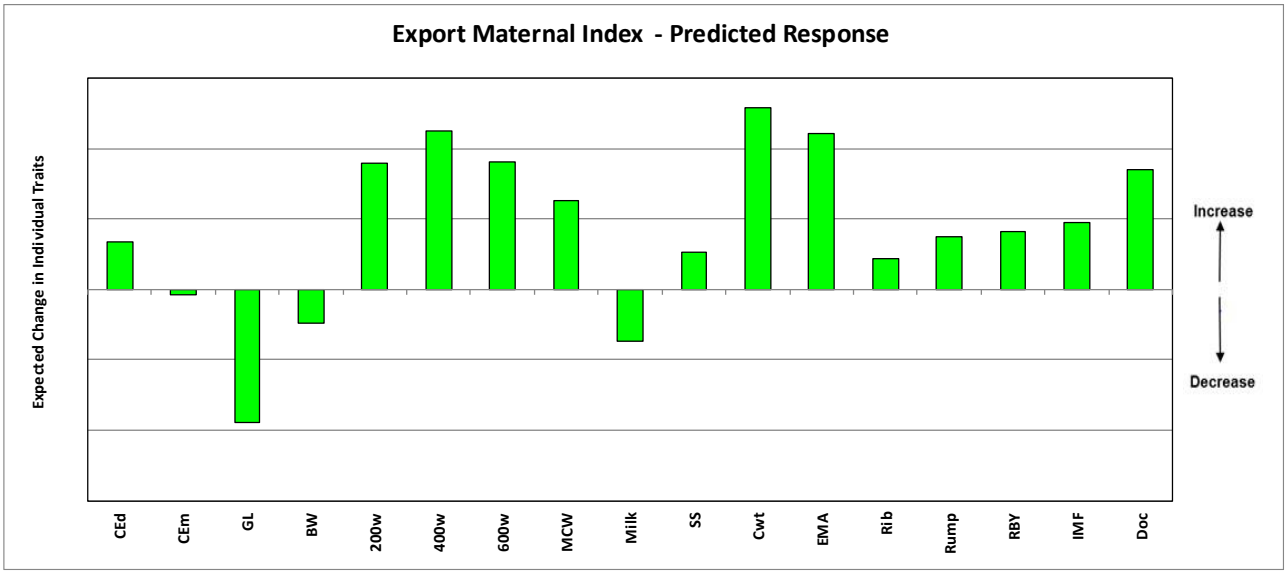


The bar graph below illustrates the magnitude and direction of emphasis that has been placed on each **BREEDPLAN EBV** within this selection index. These weightings represent the **most profitable combination of EBVs**, as determined by the BreedObject software, for the described production system/market.



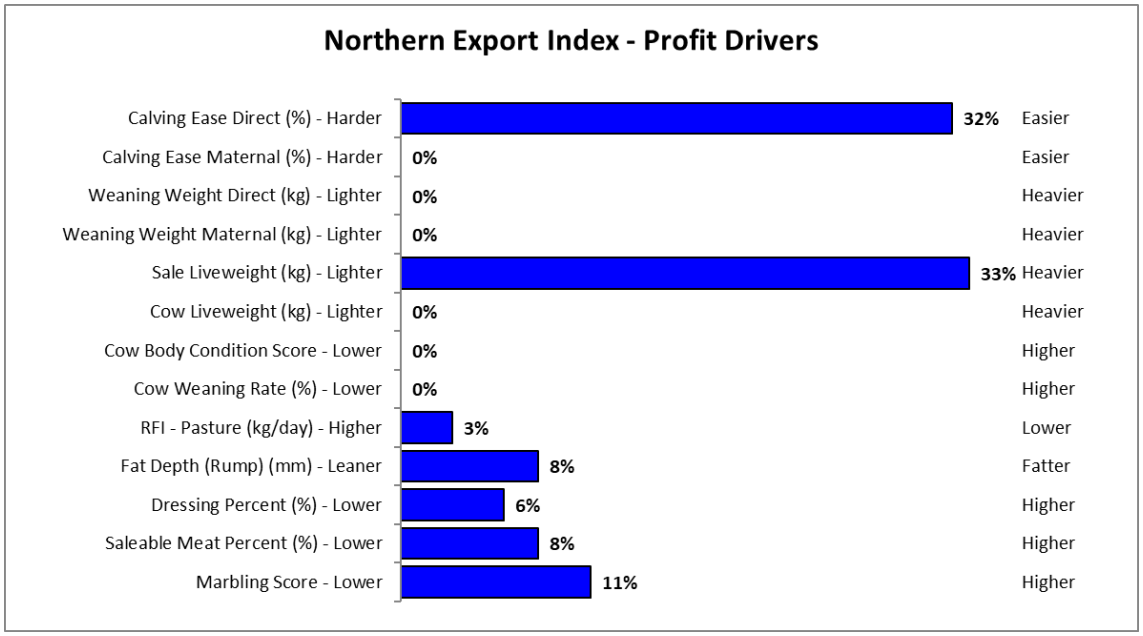
While the graphs on the previous page show the emphasis that has been placed on the production traits and each EBV within the Export Maternal Index, they do not reflect the expected change that will occur to each individual EBV if producers select animals using this selection index. The selection response will also be influenced by factors such as the genetic relationship between traits and the animals that are available for selection. For example, while there is a negative weighting on Mature Cow Weight in this selection index, it would be expected that mature cow weight would typically increase due to the large positive weighting on 600 Day Weight, and the strong genetic correlation between the two traits.

The following bar graph provides an indication of the **relative change** that would be expected in each individual BREEDPLAN EBV if producers select animals using the Export Maternal Index. The graph reflects the relative change if the Limousin Published Sires in 2024 were ranked on this selection index and the Top 10% **selected for use within a breeding program**. The response to selection may differ if a different group of animals were available for selection.

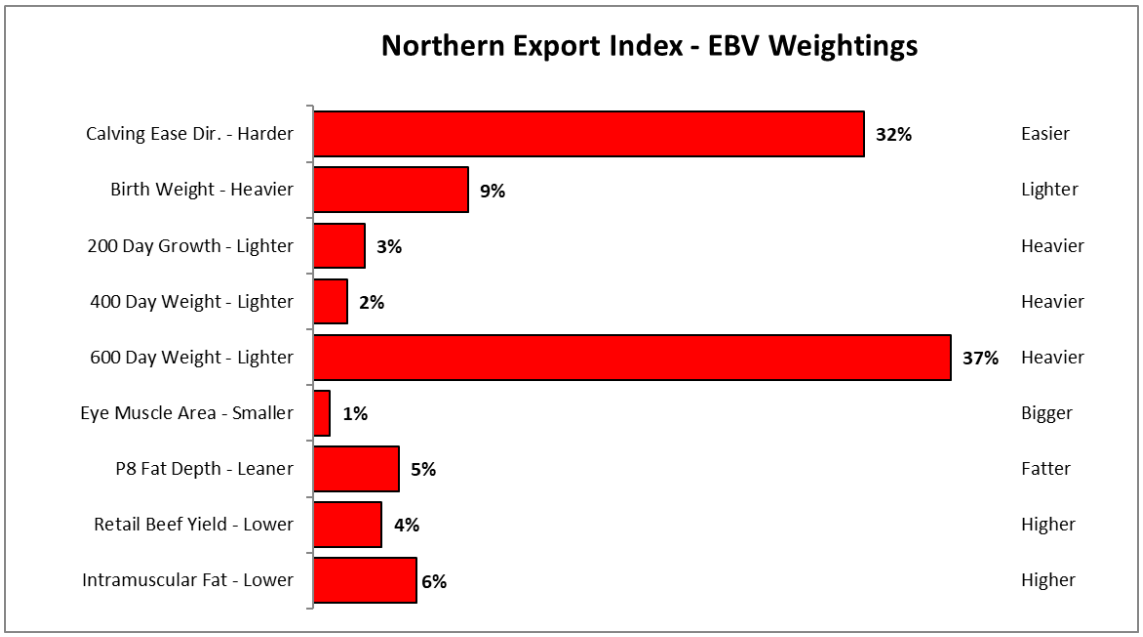


Northern Export Index

The following bar graph shows the **key economic traits**, as determined by the BreedObject software, that are important in this selection index. The different trait emphases reflect the **underlying profit drivers in a commercial operation** targeting the described production system/market.

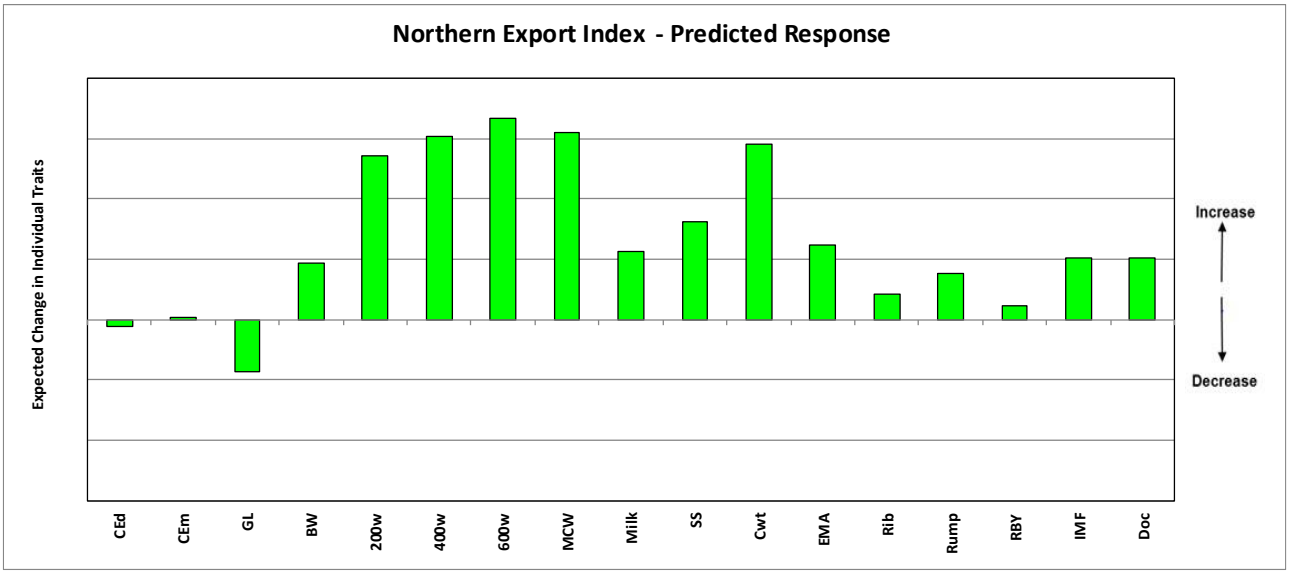


The bar graph below illustrates the magnitude and direction of emphasis that has been placed on each **BREEDPLAN EBV** within this selection index. These weightings represent the **most profitable combination of EBVs**, as determined by the BreedObject software, for the described production system/market.



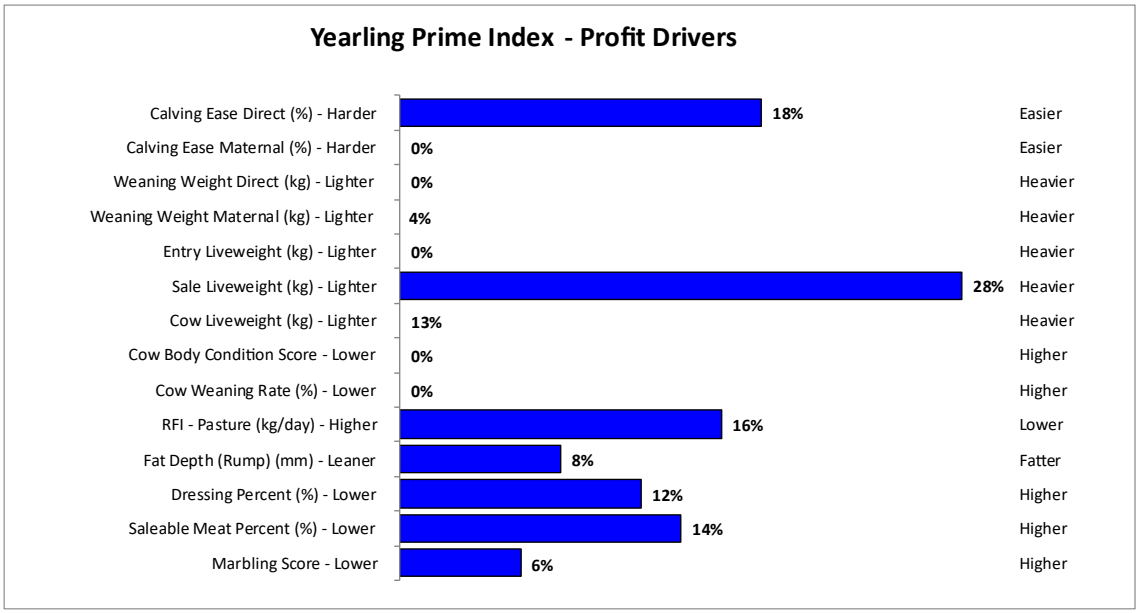
While the graphs on the previous page show the emphasis that has been placed on the production traits and each EBV within the Northern Export Index, they do not reflect the expected change that will occur to each individual EBV if producers select animals using this selection index. The selection response will also be influenced by factors such as the genetic relationship between traits and the animals that are available for selection. For example, while there are no weightings applied to maternal traits (e.g. mature cow weight) in a terminal index, it would be expected that the maternal traits will still have selection responses due to correlations between them and other traits which do have selection emphasis applied to them (e.g. growth).

The following bar graph provides an indication of the **relative change** that would be expected in each individual BREEDPLAN EBV if producers select animals using the Northern Export Index. The graph reflects the relative change if the Limousin Published Sires in 2024 were ranked on this selection index and the Top 10% **selected for use within a breeding program**. The response to selection may differ if a different group of animals were available for selection.

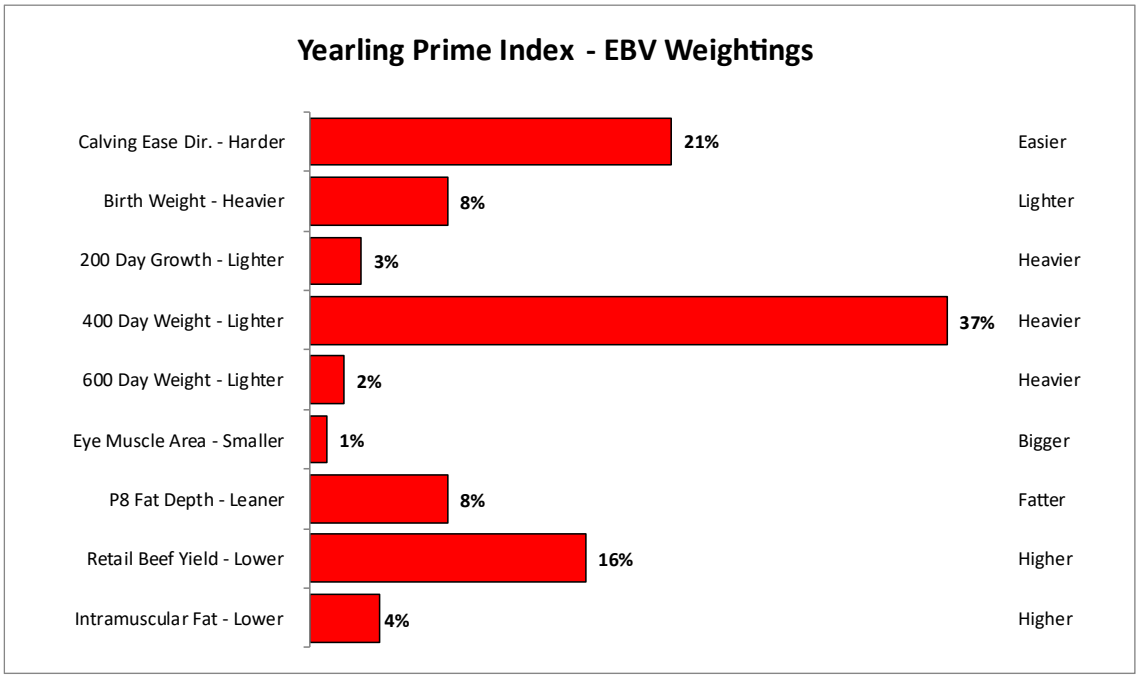


Yearling Prime Index

The following bar graph shows the **key economic traits**, as determined by the BreedObject software, that are important in this selection index. The different trait emphases reflect the **underlying profit drivers in a commercial operation** targeting the described production system/market.

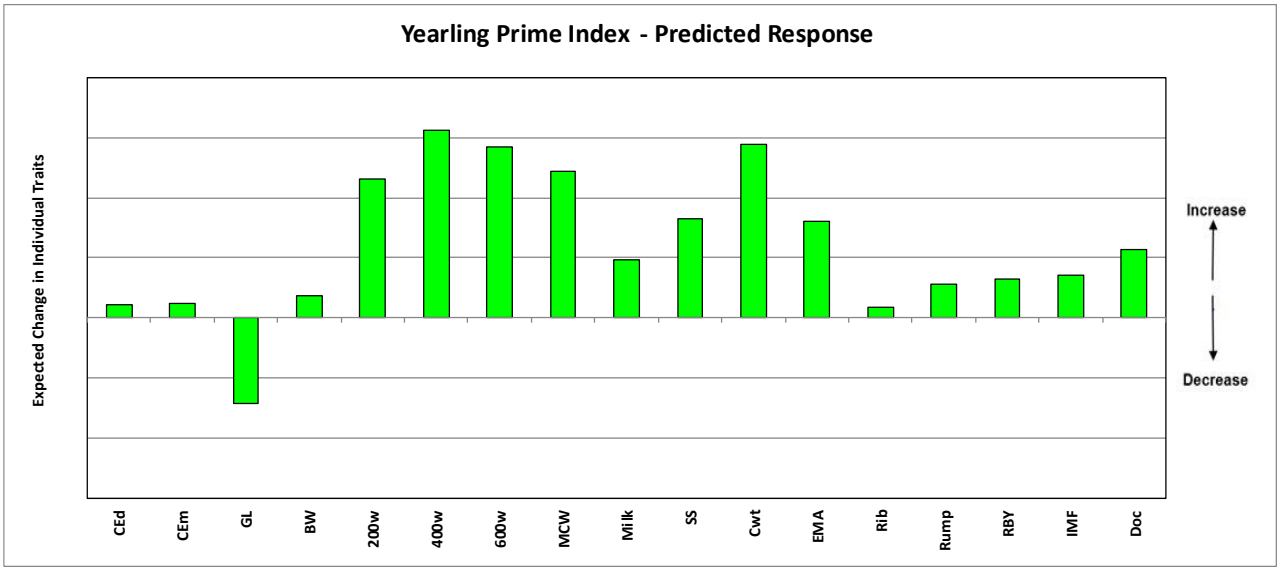


The bar graph below illustrates the magnitude and direction of emphasis that has been placed on each **BREEDPLAN EBV** within this selection index. These weightings represent the **most profitable combination of EBVs**, as determined by the BreedObject software, for the described production system/market.



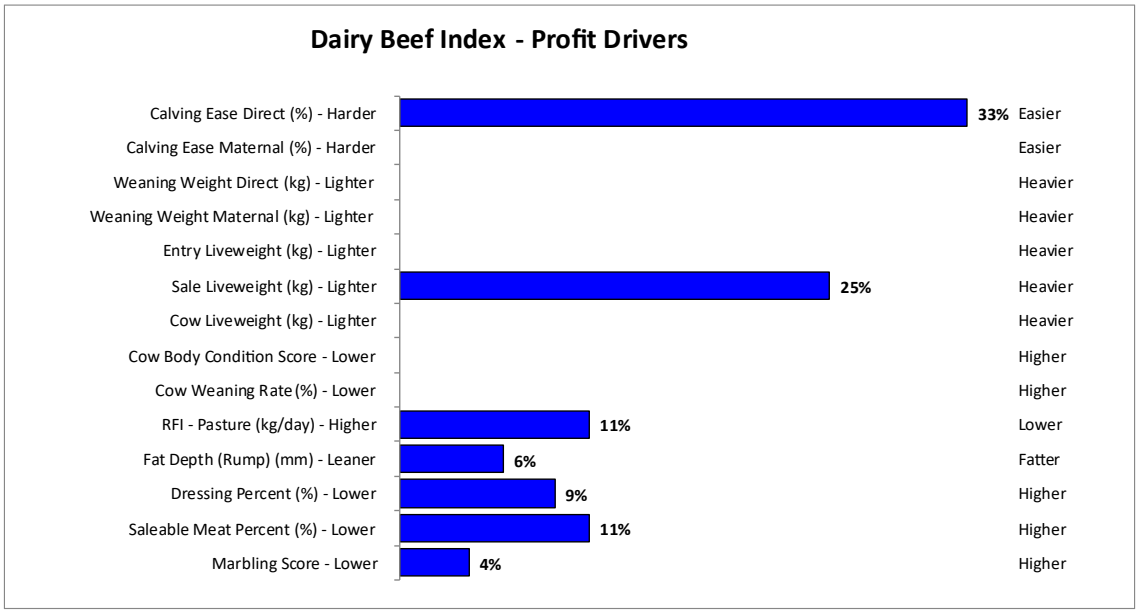
While the graphs on the previous page show the emphasis that has been placed on the production traits and each EBV within the Yearling Prime Index, they do not reflect the expected change that will occur to each individual EBV if producers select animals using this selection index. The selection response will also be influenced by factors such as the genetic relationship between traits and the animals that are available for selection. For example, while there are no weightings applied to maternal traits (e.g. mature cow weight) in a terminal index, it would be expected that the maternal traits will still have selection responses due to correlations between them and other traits which do have selection emphasis applied to them (e.g. growth).

The following bar graph provides an indication of the **relative change** that would be expected in each individual BREEDPLAN EBV if producers select animals using the Yearling Prime Index. The graph reflects the relative change if the Limousin Published Sires in 2024 were ranked on this selection index and the Top 10% **selected for use within a breeding program**. The response to selection may differ if a different group of animals were available for selection.

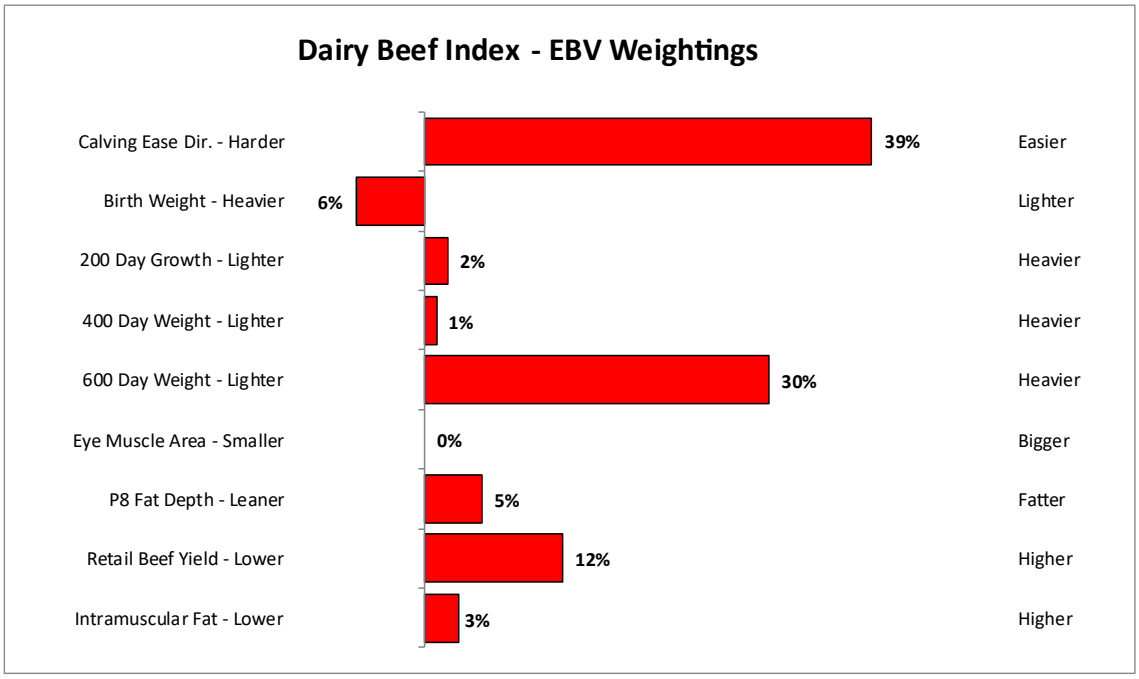


Dairy Beef Index

The following bar graph shows the **key economic traits**, as determined by the BreedObject software, that are important in this selection index. The different trait emphases reflect the **underlying profit drivers in a commercial operation** targeting the described production system/market.



The bar graph below illustrates the magnitude and direction of emphasis that has been placed on each **BREEDPLAN EBV** within this selection index. These weightings represent the **most profitable combination of EBVs**, as determined by the BreedObject software, for the described production system/market.



While the graphs on the previous page show the emphasis that has been placed on the production traits and each EBV within the Dairy Beef Index, they do not reflect the expected change that will occur to each individual EBV if producers select animals using this selection index. The selection response will also be influenced by factors such as the genetic relationship between traits and the animals that are available for selection. For example, while there are no weightings applied to maternal traits (e.g. mature cow weight) in a terminal index, it would be expected that the maternal traits will still have selection responses due to correlations between them and other traits which do have selection emphasis applied to them (e.g. growth).

The following bar graph provides an indication of the **relative change** that would be expected in each individual BREEDPLAN EBV if producers select animals using the Dairy Beef Index. The graph reflects the relative change if the Limousin Published Sires in 2024 were ranked on this selection index and the Top 10% **selected for use within a breeding program**. The response to selection may differ if a different group of animals were available for selection.