Australian Red Angus Selection Indexes: Technical Specifications

The Red Angus Society of Australia currently reports four different selection indexes. These are the:

- Supermarket Index (SUP)

- Vealer Index (VLR)

- Northern Steer Index (NTH)

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 Red Angus 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 Red Angus 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.

BREEDPLAN results are calculated by the Agricultural Business Research Institute using beef genetic evaluation analytical software developed by AGBU and Meat & Livestock Australia Limited.

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

Supermarket Index (SUP) - Estimates the genetic differences between animals in net profitability per cow joined for an example commercial herd targeting the domestic supermarket trade. Steers are either finished on grass or grain (e.g. 70 days). Steers are marketed at 450 kg live weight (250 kg HSCW and 12 mm P8 fat depth) at 15 months of age. Daughters are retained for breeding. In response to industry feedback regarding eating quality and tenderness, a small premium has been placed on marbling.

Vealer Index (VLR) - Estimates the genetic differences between animals in net profitability per cow joined for an example commercial herd targeting vealer production. Vealers are finished on grass and are marketed at 320 kg live weight (180 kg HSCW and 4 mm P8 fat depth) at 9 months of age. Daughters are retained for breeding. No marbling is required.

Northern Steer Index (NTH) - Estimates the genetic differences between animals in net profitability per cow joined for an example commercial herd in Northern Australia with Bos Indicus cows targeting grass finished steers for export. Steers are marketed at 600 kg live weight (330 kg HSCW and 10 mm P8 fat depth) at 27 months of age. Daughters are retained for breeding. In response to industry feedback regarding eating quality and tenderness, a small premium has been placed on marbling.
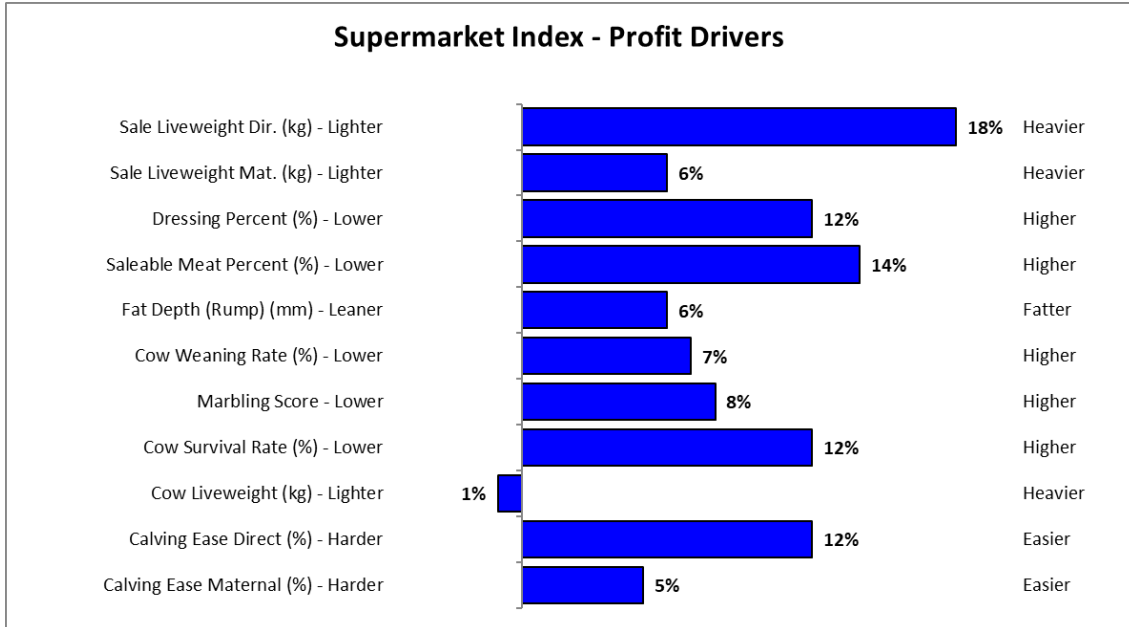
More detailed information regarding each selection index is provided on the following pages.

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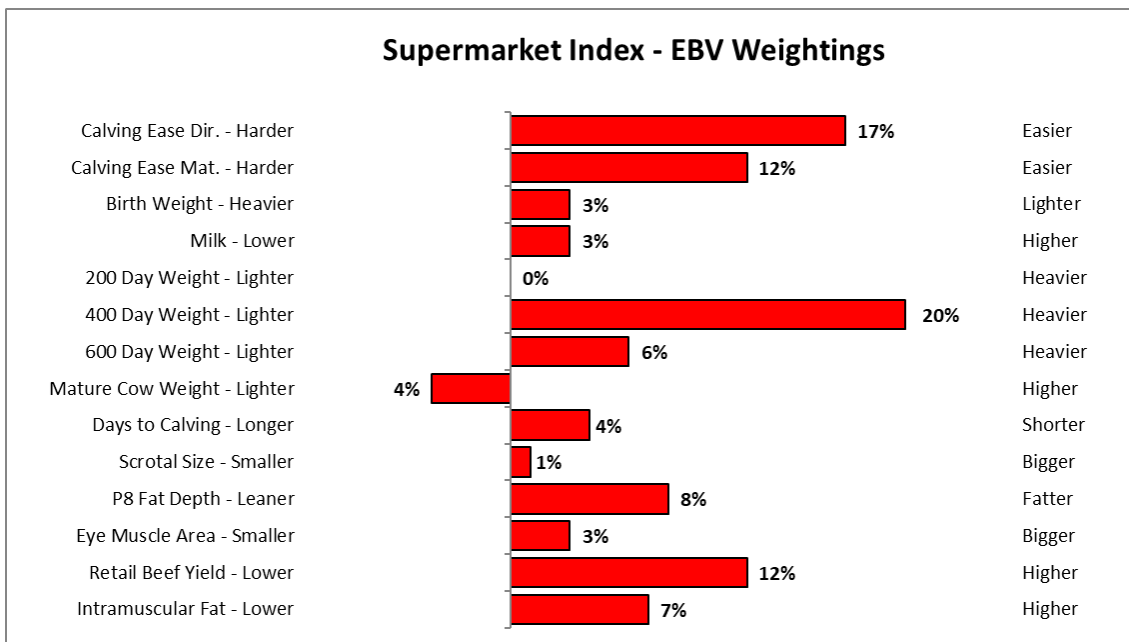
Supermarket Index

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.

Supermarket Index - Profit Drivers

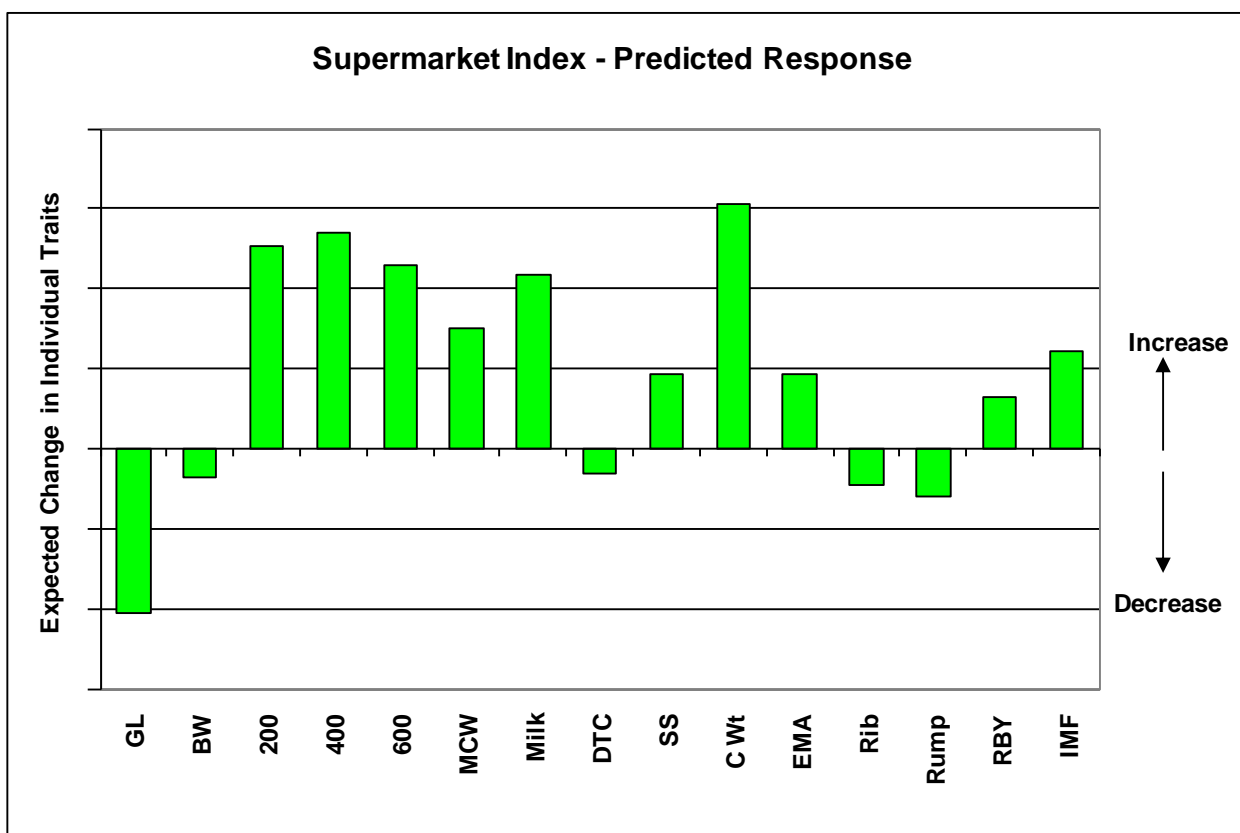| Trait	Weighting	Direction
Sale Liveweight Dir. (kg) - Lighter	18%	Heavier
Sale Liveweight Mat. (kg) - Lighter	6%	Heavier
Dressing Percent (%) - Lower	12%	Higher
Saleable Meat Percent (%) - Lower	14%	Higher
Fat Depth (Rump) (mm) - Leaner	6%	Fatter
Cow Weaning Rate (%) - Lower	7%	Higher
Marbling Score - Lower	8%	Higher
Cow Survival Rate (%) - Lower	12%	Higher
Cow Liveweight (kg) - Lighter	1%	Heavier
Calving Ease Direct (%) - Harder	12%	Easier
Calving Ease Maternal (%) - Harder	5%	Easier

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.

Supermarket Index - EBV Weightings

Trait	Weighting	Direction
Calving Ease Dir. - Harder	17%	Easier
Calving Ease Mat. - Harder	12%	Easier
Birth Weight - Heavier	3%	Lighter
Milk - Lower	3%	Higher
200 Day Weight - Lighter	0%	Heavier
400 Day Weight - Lighter	20%	Heavier
600 Day Weight - Lighter	6%	Heavier
Mature Cow Weight - Lighter	4%	Higher
Days to Calving - Longer	4%	Shorter
Scrotal Size - Smaller	1%	Bigger
P8 Fat Depth - Leaner	8%	Fatter
Eye Muscle Area - Smaller	3%	Bigger
Retail Beef Yield - Lower	12%	Higher
Intramuscular Fat - Lower	7%	Higher

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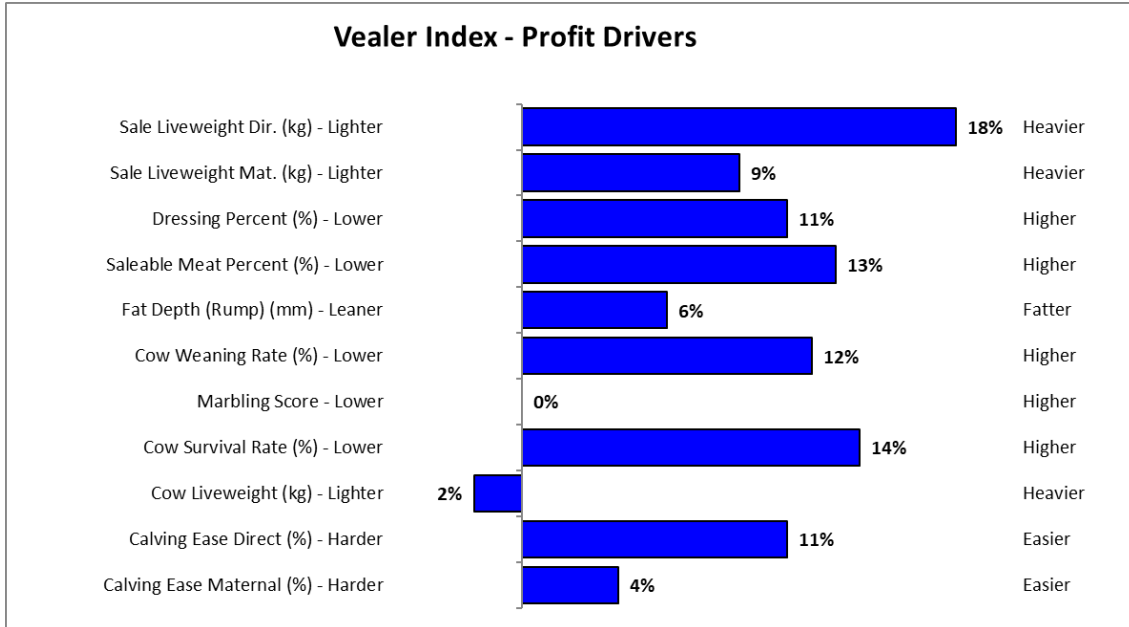For more information visit breedplan.une.edu.au

While the graphs on the previous page show the emphasis that has been placed on the production traits and each EBV within the Supermarket 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 no direct weighting on 200 Day Growth in this selection index, it would be expected that growth to 200 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 Supermarket Index. The graph reflects the relative change if the Red Angus Published Sires in 2011 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.
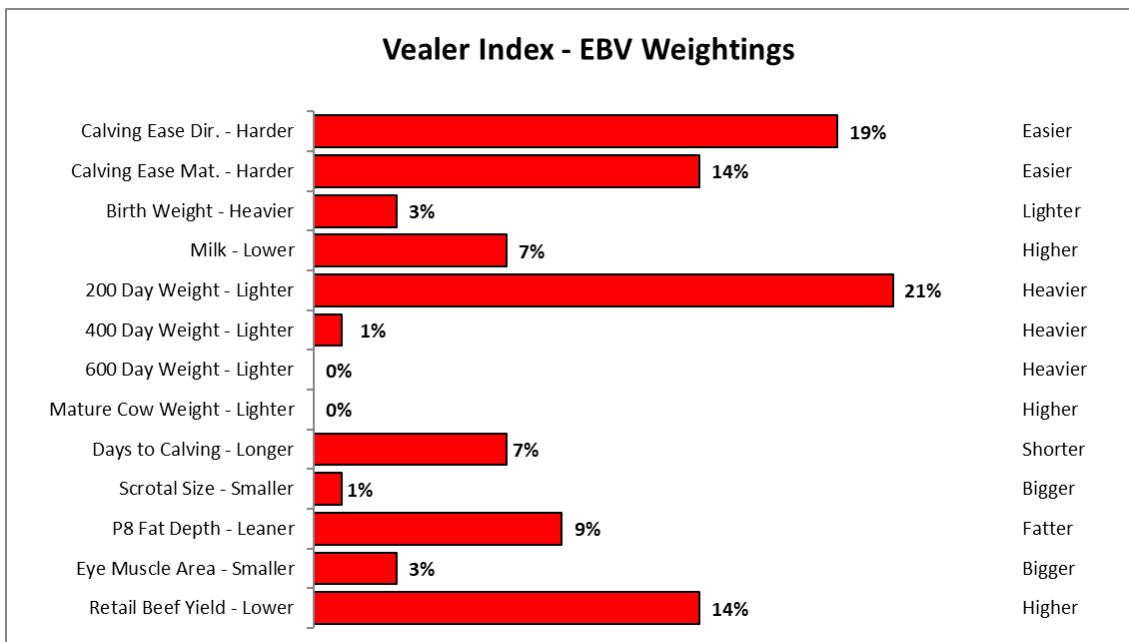
Vealer Index

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.

Vealer Index - Profit Drivers

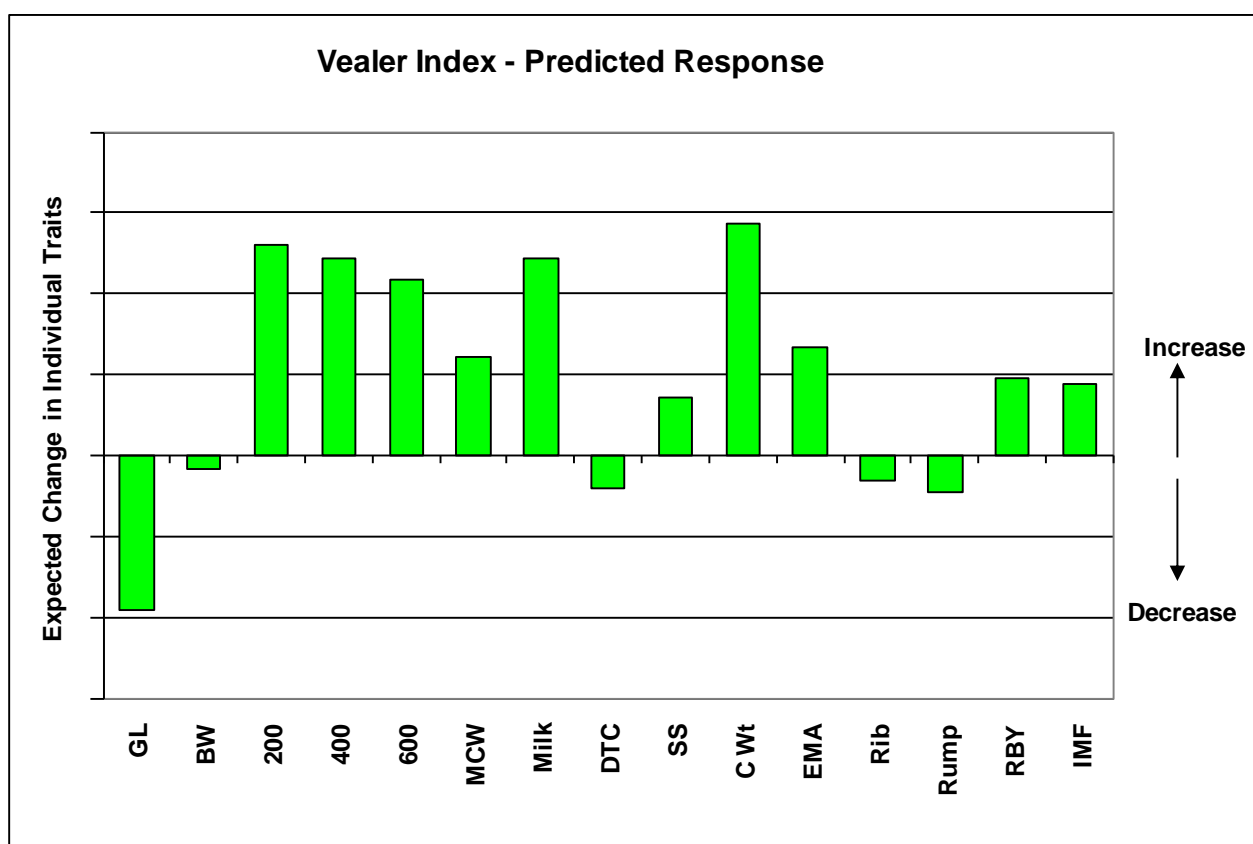| Trait	Weighting	Direction
Sale Liveweight Dir. (kg) - Lighter	18%	Heavier
Sale Liveweight Mat. (kg) - Lighter	9%	Heavier
Dressing Percent (%) - Lower	11%	Higher
Saleable Meat Percent (%) - Lower	13%	Higher
Fat Depth (Rump) (mm) - Leaner	6%	Fatter
Cow Weaning Rate (%) - Lower	12%	Higher
Marbling Score - Lower	0%	Higher
Cow Survival Rate (%) - Lower	14%	Higher
Cow Liveweight (kg) - Lighter	2%	Heavier
Calving Ease Direct (%) - Harder	11%	Easier
Calving Ease Maternal (%) - Harder	4%	Easier

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.

Vealer Index - EBV Weightings

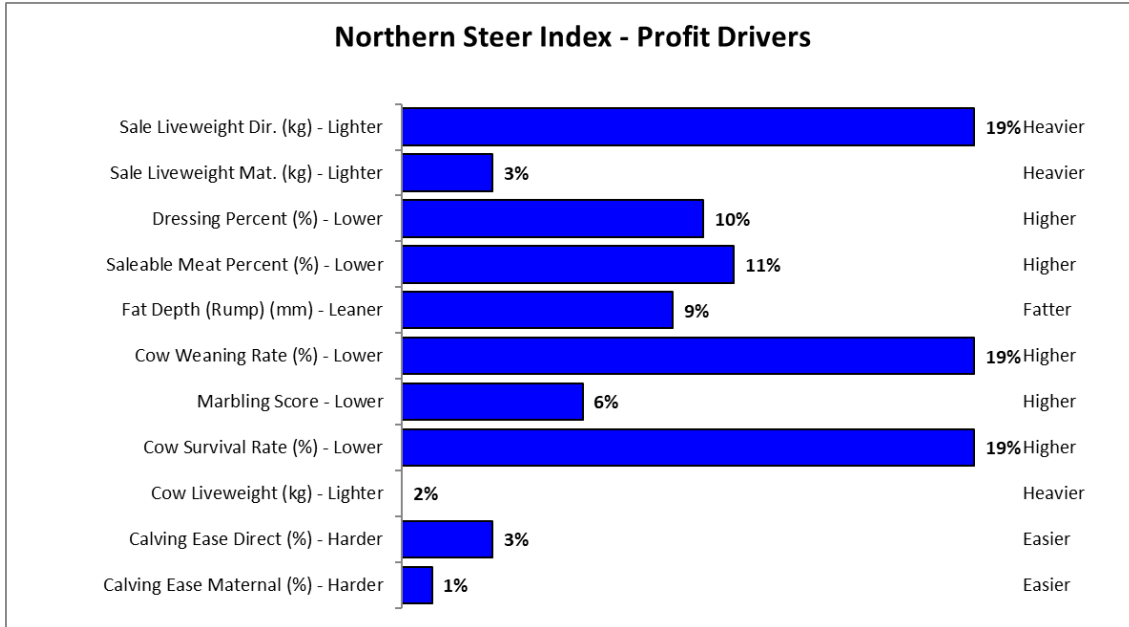| Trait	Weighting	Direction
Calving Ease Dir. - Harder	19%	Easier
Calving Ease Mat. - Harder	14%	Easier
Birth Weight - Heavier	3%	Lighter
Milk - Lower	7%	Higher
200 Day Weight - Lighter	21%	Heavier
400 Day Weight - Lighter	1%	Heavier
600 Day Weight - Lighter	0%	Heavier
Mature Cow Weight - Lighter	0%	Higher
Days to Calving - Longer	7%	Shorter
Scrotal Size - Smaller	1%	Bigger
P8 Fat Depth - Leaner	9%	Fatter
Eye Muscle Area - Smaller	3%	Bigger
Retail Beef Yield - Lower	14%	Higher

While the graphs on the previous page show the emphasis that has been placed on the production traits and each EBV within the Vealer 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 slight weighting on 400 Day Weight in this selection index, it would be expected that growth to 400 days would typically increase due to the large positive weighting on 200 Day Growth, 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 Vealer Index. The graph reflects the relative change if the Red Angus Published Sires in 2011 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.

Vealer Index - Predicted Response

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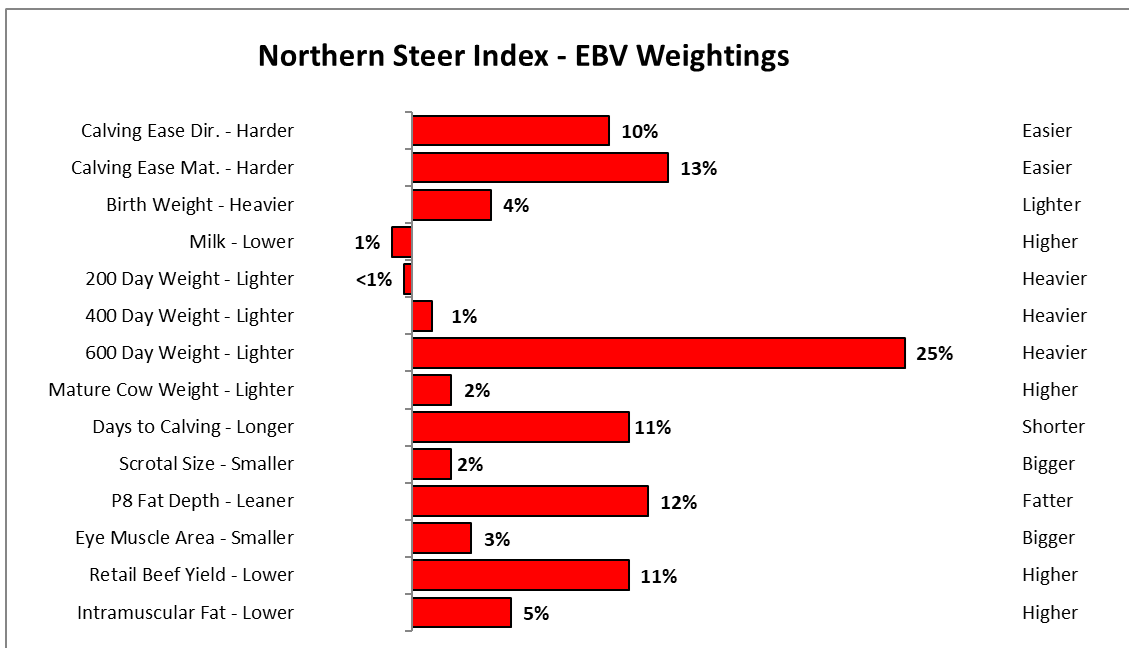For more information visit breedplan.une.edu.au

Northern Steer 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.

Northern Steer Index - Profit Drivers

Trait		Weighting
Sale Liveweight Dir. (kg) - Lighter	Heavier	19%
Sale Liveweight Mat. (kg) - Lighter	Heavier	3%
Dressing Percent (%) - Lower	Higher	10%
Saleable Meat Percent (%) - Lower	Higher	11%
Fat Depth (Rump) (mm) - Leaner	Fatter	9%
Cow Weaning Rate (%) - Lower	Higher	19%
Marbling Score - Lower	Higher	6%
Cow Survival Rate (%) - Lower	Higher	19%
Cow Liveweight (kg) - Lighter	Heavier	2%
Calving Ease Direct (%) - Harder	Easier	3%
Calving Ease Maternal (%) - Harder	Easier	1%

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.

Northern Steer Index - EBV Weightings

EBV		Weighting
Calving Ease Dir. - Harder	Easier	10%
Calving Ease Mat. - Harder	Easier	13%
Birth Weight - Heavier	Lighter	4%
Milk - Lower	Higher	1%
200 Day Weight - Lighter	Heavier	<1%
400 Day Weight - Lighter	Heavier	1%
600 Day Weight - Lighter	Heavier	25%
Mature Cow Weight - Lighter	Higher	2%
Days to Calving - Longer	Shorter	11%
Scrotal Size - Smaller	Bigger	2%
P8 Fat Depth - Leaner	Fatter	12%
Eye Muscle Area - Smaller	Bigger	3%
Retail Beef Yield - Lower	Higher	11%
Intramuscular Fat - Lower	Higher	5%

BREEDPLAN results are calculated by the Agricultural Business Research Institute using beef genetic evaluation analytical software developed by AGBU and Meat & Livestock Australia Limited.

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While the graphs on the previous page show the emphasis that has been placed on the production traits and each EBV within the Northern Steer 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 slight weighting on 400 Day Weight in this selection index, it would be expected that growth to 400 days 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 Northern Steer Index. The graph reflects the relative change if the Red Angus Published Sires in 2011 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.