Selecting Animals Using Red Angus Selection Indexes

The Selection Index value for an animal is effectively an EBV of the animal’s profitability in a defined commercial production system and market. Ranking seedstock animals on their Selection Index value sorts them based on their progeny’s expected profitability for the targeted production system.

As a guide to using Selection Indexes, it is recommended that producers, both seedstock and commercial, complete the following steps:
(i) Identify the Selection Index of most relevance
(ii) Rank animals on the Selection Index
(iii) Consider the individual EBVs of importance
(iv) Consider other traits of importance

1. Identify the Selection Index

As mentioned above, a Selection Index value for an animal is effectively an EBV of the animal’s profitability in a particular commercial production scenario and market. Consequently, before using Selection Indexes, producers should identify the index that is of most relevance to their particular production system. For seedstock producers, this may be the production system of their bull buying clients. In order to identify the most relevant Selection Index for use, it is recommended that producers consider the description of each Selection Index available. Following are the descriptions for the 3 Red Angus Selection Indexes:

- **Supermarket (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 (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 (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.

Selection Indexes are primarily developed for the commercial sector, as indicated by the descriptions above, therefore it is relatively simple for a commercial producer to select one of the available Selection Indexes to use in their selection decisions. This is a slightly more complex task for seedstock producers as they are generally providing bulls to a range of commercial producers who are in a range of production systems and supplying a range of market end points. In this situation we recommend that Red Angus seedstock producers use the Selection Index that suits the majority of their commercial clients and recognize that the three Red Angus Selection Indexes are highly correlated, therefore
selecting on one (e.g. SUP) will also generally lead to a positive trend for the others (e.g. VLR and NTH).

Identifying the Selection Index of most relevance to the production system that the animals will be used in is of utmost importance. Using the wrong Selection Index will potentially compromise any subsequent selection decisions that are made.

2. Rank Animals on Selection Index

Once the Selection Index of most relevance has been identified, the animals available for selection should then be ranked on that particular Selection Index. An example of this is in figure 1, where the “Australian Made” AI sires list has been ranked in descending order on the Red Angus Supermarket Index using the Red Angus online EBV Enquiry facility.

<table>
<thead>
<tr>
<th>Name(TD)</th>
<th>Beef Age (days)</th>
<th>Birth Wt (kg)</th>
<th>200 Day Wt (kg)</th>
<th>400 Day Wt (kg)</th>
<th>600 Day Wt (kg)</th>
<th>Miscarriage Incidence (%)</th>
<th>SCAR Size (cm2)</th>
<th>Body Area (cm2)</th>
<th>Eye Area (cm2)</th>
<th>Ribs (cm)</th>
<th>Yields (%)</th>
<th>IMF (%)</th>
<th>Supermarket Index</th>
<th>Yealer Index</th>
<th>Northern Steer Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>BST TULLATOOOLA MR BEEF X39 BSTX39 (AD)</td>
<td>-2.5</td>
<td>+2.3</td>
<td>+3.3</td>
<td>+62</td>
<td>+85</td>
<td>+55</td>
<td>+12</td>
<td>-</td>
<td>+0.7</td>
<td>-1.1</td>
<td>-1.6</td>
<td>+0.7</td>
<td>+39</td>
<td>+32</td>
<td>+33</td>
</tr>
<tr>
<td>BST TULLATOOOLA MR BEEF X39 BSTX39 (AD)</td>
<td>-1.8</td>
<td>+1.5</td>
<td>+2.8</td>
<td>+66</td>
<td>+84</td>
<td>+13</td>
<td>+1.0</td>
<td>-</td>
<td>+0.5</td>
<td>-1.3</td>
<td>-1.9</td>
<td>+1.0</td>
<td>+36</td>
<td>+34</td>
<td>+34</td>
</tr>
<tr>
<td>SOUNDSEED RED POCKET LADYDOO (AD)</td>
<td>-3.0</td>
<td>-1.1</td>
<td>+3.5</td>
<td>+53</td>
<td>+55</td>
<td>+13</td>
<td>+1.5</td>
<td>+39</td>
<td>+1.1</td>
<td>-0.9</td>
<td>-1.5</td>
<td>+0.7</td>
<td>+53</td>
<td>+37</td>
<td>+53</td>
</tr>
<tr>
<td>OK RED ABSOLUTE POWER AT OR A2 (AD)</td>
<td>-0.8</td>
<td>+2.0</td>
<td>+2.5</td>
<td>+59</td>
<td>+50</td>
<td>+12</td>
<td>-</td>
<td>+0.5</td>
<td>-1.1</td>
<td>-1.7</td>
<td>+0.9</td>
<td>-</td>
<td>+31</td>
<td>+33</td>
<td>+33</td>
</tr>
<tr>
<td>OK RED EXTRA FLASH OK X11 (ET) (AD)</td>
<td>-0.7</td>
<td>+3.4</td>
<td>+2.5</td>
<td>+58</td>
<td>+64</td>
<td>+9</td>
<td>-</td>
<td>+1.4</td>
<td>-0.3</td>
<td>-0.5</td>
<td>+0.8</td>
<td>-0.2</td>
<td>+31</td>
<td>+42</td>
<td>+42</td>
</tr>
<tr>
<td>BST TULLATOOOLA SON OF ROB X38 BSTX38 (AD)</td>
<td>-1.3</td>
<td>+1.7</td>
<td>+2.1</td>
<td>+45</td>
<td>+50</td>
<td>+7</td>
<td>+0.2</td>
<td>+32</td>
<td>+1.3</td>
<td>-0.5</td>
<td>-0.8</td>
<td>-0.2</td>
<td>+29</td>
<td>+25</td>
<td>+31</td>
</tr>
<tr>
<td>ANAMA RED UNDA PIERRO PI A171 (AA)</td>
<td>+0.9</td>
<td>+4.3</td>
<td>+2.0</td>
<td>+57</td>
<td>+62</td>
<td>+6</td>
<td>+0.8</td>
<td>+35</td>
<td>+2.4</td>
<td>-0.4</td>
<td>+1.1</td>
<td>-0.1</td>
<td>+29</td>
<td>+26</td>
<td>+41</td>
</tr>
<tr>
<td>BAYSWATER MR MAGIC XII (AD)</td>
<td>-0.5</td>
<td>+0.4</td>
<td>+1.7</td>
<td>+31</td>
<td>+35</td>
<td>+9</td>
<td>-</td>
<td>+0.7</td>
<td>0.0</td>
<td>-0.1</td>
<td>-0.2</td>
<td>+0.4</td>
<td>+28</td>
<td>+23</td>
<td>+27</td>
</tr>
<tr>
<td>TRESCOPE PARK KING POLYMYTHIC (AD)</td>
<td>+0.3</td>
<td>+3.1</td>
<td>+2.4</td>
<td>+49</td>
<td>+47</td>
<td>+7</td>
<td>-</td>
<td>+1.8</td>
<td>-0.5</td>
<td>-0.8</td>
<td>-0.9</td>
<td>-0.1</td>
<td>+28</td>
<td>+28</td>
<td>+34</td>
</tr>
<tr>
<td>BAYSWATER SCARDO DZ01 (AD)</td>
<td>-</td>
<td>+1.8</td>
<td>+19</td>
<td>+59</td>
<td>+44</td>
<td>+10</td>
<td>-</td>
<td>+0.7</td>
<td>+0.3</td>
<td>0.0</td>
<td>0.0</td>
<td>-</td>
<td>+24</td>
<td>+24</td>
<td>+23</td>
</tr>
<tr>
<td>BERNDALE PARK STRIKER Y61 EB016 (ET) (AD)</td>
<td>+0.3</td>
<td>+2.1</td>
<td>+17</td>
<td>+26</td>
<td>+36</td>
<td>+39</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+19</td>
<td>+21</td>
<td>+26</td>
</tr>
<tr>
<td>Breed Ave. EBVs for 2006 Born Calves</td>
<td>-0.7</td>
<td>+2.2</td>
<td>+2.2</td>
<td>+34</td>
<td>+45</td>
<td>+44</td>
<td>+0.9</td>
<td>+29</td>
<td>+0.9</td>
<td>-0.4</td>
<td>-0.7</td>
<td>+0.8</td>
<td>+27</td>
<td>+27</td>
<td>+32</td>
</tr>
</tbody>
</table>

Figure 1. “Australian Made” AI sires list ranked in descending order on the Red Angus Supermarket Index

When ranking animals on the Selection Index, producers should also take into account the following points:

- Selection Indexes can not be used to rank animals across breeds. As with EBVs, the Selection Indexes for animals of different breeds are calculated within different BREEDPLAN evaluations. Consequently, Selection Indexes can only be used to compare animals with other animals of the same breed.

- Producers can use Selection Indexes to see where an animal ranks compared to other animals of the same breed by comparing its Selection Index value to the current breed average value and to the percentile table.

Comparing an animal with the current breed average Selection Index will give you an indication of how the animal compares with the current genetic level for the breed in terms of profitability for that particular production system and market scenario. The current breed average values are located on the last row in figure 1. If we consider the Supermarket Selection Index value of BST Tullatooloo Mr Beef X39 of +48 and compare it to the breed average value, it indicates that this animal is expected to have genetics that are more profitable than the current genetic level of the breed if the animal is used within this production scenario.
Comparison of an animal’s Selection Index value to the breed average can be taken a step further by looking at the Percentile Bands table to determine exactly where the animal ranks within the breeds. If we consider the animal in the above example with the Supermarket Selection Index value of +48, the Percentile Table below indicates that the animal is in fact ranked in the top 1% of the breed for that particular production scenario and market endpoint (see circled information in figure 2.).

![Percentile Band Table]

**Figure 2. Red Angus Percentile Bands for 2006 Born Calves**

As with the breed average EBVs and Indexes, a Percentile Table should be enclosed in all BREEDPLAN reports, sale catalogues etc.

3. Consider Individual EBVs of Importance

While Selection Indexes combine all the available EBV information to provide an indication of an animal’s overall genetic merit, it may still be important to pay attention to the animal’s individual EBVs for traits of particular importance. For example, producers may pay attention to:

- Birth Weight and Gestation Length EBVs if they are planning to use the bull over heifers
- Fat EBVs if they require more or less fat on their steers at slaughter
- IMF EBVs if they want to specifically improve the marbling in their herd

In order to consider the animal’s individual EBVs, it is recommended that producers set maximum/minimum EBV ranges for the individual traits of particular importance. Animals should firstly be ranked on the Selection Index of relevance but then any animals whose individual EBVs fall outside of the acceptable range be excluded from selection.

4. Consider Other Traits of Importance

While Selection Indexes take into account all the available performance information on an animal, they do not consider all the traits of functional and economic importance. Consequently, Selection Indexes should be used in association with visual assessment for other traits of importance that may not be accounted for in the EBVs (eg. structural soundness, temperament).

You can access further information on the Red Angus Selection Indexes from the Red Angus SBTS Technical Officer, Christian Duff (ph: 02 6773 2472 or email: christian@sbts.une.edu.au) or on the SBTS website (http://sbts.une.edu.au) within the “BREEDPLAN Documents” link.

*Article compiled by Christian Duff for inclusion in Red Angus Express, November 2008.*