Breeding Worth explained

Eight traits of a highly efficient cow

- Milkfat
- Somatic cell
- Milk volume
- Residual survival
- Fertility
- Protein
- Body Condition Score
- Live-weight

Genetic ability for breeding replacements

How to use Breeding Worth, Production Worth and Lactation Worth

**BW**
- **Meaning:** Genetic ability for breeding replacements
- **Use for:** Selecting bulls and replacements and purchasing heifers
- **$ terms:** +68 = expected to breed daughters that are $34 more profitable than daughters of a 0 BW cow
- **Traits:** Milkfat, protein, milk volume, liveweight, fertility, somatic cell, residual survival and body condition score

**PW**
- **Meaning:** Lifetime performance
- **Use for:** Culling and purchasing cows
- **$ terms:** +78 = expected to generate $78 more profit, in each of her lactations, than a cow with a PW of 0
- **Traits:** Milkfat, protein, milk volume, liveweight

**LW**
- **Meaning:** Current season performance
- **Use for:** Culling
- **$ terms:** +98 = expected to generate $98 more profit, in the current season, than a cow with a LW of 0
- **Traits:** Milkfat, protein, milk volume, liveweight

Genetic gain contributes $45 million annually to the national economy which compounds over time.

For the best bulls consult the RAS list.

dairynz.co.nz/nzael

National breeding objective (BW):

"Animals whose progeny will be the most efficient converters of feed into farmer profit."

- **The Breeding Worth** ranks male and female animals for their genetic ability for breeding replacements
- **The Production Worth** ranks female animals for their lifetime performance.
- **The Lactation Worth** ranks female animals for their current season performance.
Calculating breeding worth

Expressed as: $ net farm income/5 tonne of dry matter

BW ranks bulls and cows on their expected ability to breed profitable and efficient replacements as it includes the economically important traits.

How profitable are they for breeding replacements?

Genetic base

The genetic base, also referred to as the Base Cow, is the average of a group of animals whose evaluation is set at zero for all traits to form a reference point for comparison.

The base cow is currently the average of 2005 born cows.

For more info: dairynz.co.nz/geneticbasecow

How to read breeding values

Introducing the example bull — Sample Sam

Breeding values

Breeding values are the genetic merit of an animal for the individual traits relative to the Base Cow.

Protein (kg) – indicates that Sample Sam is expected to produce daughters on average that will produce 10 kg (half of 20 kg) more protein per lactation than the Base Cow. Likewise for Milkfat (kg) and Milk Volume (litres) where half of Sample Sam’s genetic merit, on average, is expressed in his daughters.

Liveweight (kg) – indicates that Sample Sam on average will produce daughters that are 5 kg (half of 10 kg) heavier than the Base Cow.

Fertility (%) – indicates that 2% (half of 4%) more of Sample Sam’s daughters will calve in the first 42 days of the herds calving period compared to the Base Cow.

Somatic Cell (score) – indicates that Sample Sam on average, will produce daughters with a lower Somatic Cell score of -0.1 (half of -0.2) than the Base Cow. The lower the Somatic Cell BV the better.

Residual Survival (days) – indicates that Sample Sam is expected to produce daughters that will last on average 50 days longer (half of 100) than the Base Cow after separately accounting for the genetic effects of production, fertility, liveweight and somatic cell score on longevity.

Body Condition Score (score) – Indicates that the daughters of Sample Sam will have a BCS which 0.1 (Half of 0.2) higher than the base animal (60 days into their lactation).

There are 24 additional breeding values for you to explore such as; Gestation Length, Calving Difficulty, Udder Overall, Milking Speed, Capacity and Overall Opinion. These additional BVs can be used to further narrow down farmer’s selections of high BW bulls.

Economic values

Economic values are calculated using farm economic models which take into account milk production, historical, current and forecast milk prices, income from culls, surplus cows and bobbies, cost of generating replacements and dairy farm expenses.

These are updated in February every year.

EVs as at Feb 2018:

<table>
<thead>
<tr>
<th>Protein ($/kg)</th>
<th>Milkfat ($/kg)</th>
<th>Milk Volume ($/kg)</th>
<th>Liveweight ($/kg)</th>
<th>Fertility ($/%)</th>
<th>SCS ($/unit SCS)</th>
<th>Residual Survival ($/days)</th>
<th>Body Condition Score ($/BCS point)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.06</td>
<td>2.85</td>
<td>-0.088</td>
<td>-1.30</td>
<td>6.55</td>
<td>-38.33</td>
<td>0.124</td>
<td>100.60</td>
</tr>
</tbody>
</table>
Delving deeper — no two bulls are the same

Two bulls can have exactly the same BW but will have reached that through very different strengths.

### Which bull is best?

<table>
<thead>
<tr>
<th>BV Traits</th>
<th>BULL A</th>
<th>BULL B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BV</td>
<td>EV</td>
</tr>
<tr>
<td>Milkfat ($/kg)</td>
<td>31 x 2.85</td>
<td>43 x 2.85</td>
</tr>
<tr>
<td>Milk Protein ($/kg)</td>
<td>14 x 6.06</td>
<td>30 x 6.06</td>
</tr>
<tr>
<td>Milk Volume ($/L)</td>
<td>770 x -0.088</td>
<td>1387 x -0.088</td>
</tr>
<tr>
<td>Liveweight ($/kg)</td>
<td>38 x -1.30</td>
<td>27 x -1.30</td>
</tr>
<tr>
<td>Fertility ($/%)</td>
<td>5.8 x 6.55</td>
<td>-4.1 x 6.55</td>
</tr>
<tr>
<td>Somatic Cell Score ($/SCS)</td>
<td>-0.41 x -38.33</td>
<td>0.11 x -38.33</td>
</tr>
<tr>
<td>Residual Survival ($/days)</td>
<td>5 x 0.124</td>
<td>140 x 0.124</td>
</tr>
<tr>
<td>BCS ($/BCS point)</td>
<td>0.2 x 100.60</td>
<td>-0.1 x 100.60</td>
</tr>
</tbody>
</table>

- Bull A has superior Somatic Cell and Fertility traits.
- Bull B has superior Production traits.

The best bull is the bull that fits your herd breeding objective.

### Reliability explained

Reliability, which is shown on a scale of 0 to 100, measures how much information has contributed to the trait evaluation for the animal. It indicates confidence that the BV is a good indication of the animal’s true genetic merit.

#### Typical number of daughters milking

- 29% with 100 daughters
- 70% with 71 daughters
- 75% with 59 daughters
- 85% with 46 daughters
- 99% with 12 daughters

#### Expected maximum shift in BW (+/-)

- 100 with 12 daughters
- 71 with 46 daughters
- 59 with 85% daughters
- 46 with 75% daughters
- 12 with 29% daughters

### How is ancestry/progeny information weighted in a bull’s BW?

- **Progeny information**: 100%
- **Ancestry information**: 80% for 20 daughters, 92% for 80 daughters

The best bull is the bull that fits your herd breeding objective.
Keep up-to-date with the ranking of active sires (RAS)

RAS lists are ranked on BW and updated every animal evaluation run with the latest information added to the bulls proof. List criteria are:

- Sire enrolled by marketer
- Minimum reliability of 75% from progeny and parentage information sources
- At least 10 herds with two-year-old herd tested daughters included in the bull’s proof
- Have at least 500 doses of semen available in the following mating season.

<table>
<thead>
<tr>
<th>BULL NAME</th>
<th>BREEDING VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BW($)</td>
</tr>
<tr>
<td></td>
<td>210 / 87</td>
</tr>
<tr>
<td>CARSONS MECCA PULSE SIF 112035</td>
<td>253 / 98</td>
</tr>
<tr>
<td>SAN RAY FM BEAMER ET 52F 111037</td>
<td>229 / 92</td>
</tr>
<tr>
<td>LINAN INTEGRITY WINSTON 3M022</td>
<td>219 / 87</td>
</tr>
</tbody>
</table>

Visit dairynz.co.nz/ras
The NZAEL RAS list is updated every 3-4 weeks.

Rule of thumb...
Reduce cow numbers by one cow per 300 each year to fully exploit genetic gains
OR
Increase feed supply by 5 t DM per 300 cows per year.