Value of Classification

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When Tom Byers, Holstein Canada’s Head Classifier, visited New Zealand in May 2008 he continually reinforced the advantage that breeders enjoy when they classify their cows. Holstein Canada has carried out extensive research comparing the differences in longevity and milk production that each classification award achieves. From that research, at a glance, you can tell if a two-year-old in-milk heifer is going to be a significant contributor to your herd or not.

The research followed 100,000 cows that were classified as two-year-olds and found that the heifers that were scored higher usually completed more lactations in a herd and produced more milk than heifers that received lower classifications.

Is this relevant to New Zealand conditions? Can we predict a cow’s performance in a herd based on her classification as a two-year-old? Will she produce more milk if she is given a high classification? Will she last longer in a herd with a high classification compared to a cow that has scored lower? The answer is to replicate the research by selecting a population of two-year-olds in New Zealand and follow their performance over time.

**The Theses**

1. That a two-year-old heifer will produce more milk over time if awarded a high classification (Good Plus or Very Good) than a two-year-old heifer that has received a lower classification (Fair or Good).

2. That a two-year-old heifer that has received a high classification (Good Plus or Very Good) will last longer in the herd than a two-year-old heifer that has been awarded a lower classification (Fair or Good).

**The Method**

Two thousand heifers that were born in 2002 were randomly selected as two-year-olds out of a total 10,368 registered two-year-olds that were herd tested in 2004. The group was divided into two groups; one group included all the registered two-year-olds classified in 2004 (a total 4,723), the second group were all the registered two-year-olds that were not classified in 2004 (total 5,645). From each group 1,000 heifers were randomly selected, using a random sampling program. The group of non-classified heifers were used as a comparison group.

The production, TOP raw scores and classification results were gathered for each milking season. The classified group was divided into each classification of Fair (F) 70-74, Good (G) 75-79, Good Plus (GP) 80-84, Very Good (VG) 85-89 (Excellent is not awarded to two-year-olds) and their average production and TOP raw scores were recorded for comparison. The overall averages were calculated for the non-classified group. For every season, the heifers for each classification group remained in the group they were originally allocated (based on their classification as a two-year-old) even when they had been re-classified.

Table One describes the number of cows in each classification group in each season to date.

<table>
<thead>
<tr>
<th>Classification Group</th>
<th>2004/05</th>
<th>2005/06</th>
<th>2006/07</th>
<th>2007/08</th>
<th>2008/09</th>
<th>2009/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Fair</td>
<td>1</td>
<td>0.1%</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>2.8%</td>
</tr>
<tr>
<td>Good</td>
<td>42</td>
<td>4.2%</td>
<td>30</td>
<td>3.9%</td>
<td>22</td>
<td>3.4%</td>
</tr>
<tr>
<td>Good Plus</td>
<td>838</td>
<td>83.8%</td>
<td>625</td>
<td>81.6%</td>
<td>540</td>
<td>83.2%</td>
</tr>
<tr>
<td>Very Good</td>
<td>119</td>
<td>11.9%</td>
<td>111</td>
<td>14.5%</td>
<td>87</td>
<td>13.4%</td>
</tr>
<tr>
<td>Total</td>
<td>1,000</td>
<td>100.0%</td>
<td>766</td>
<td>100.0%</td>
<td>649</td>
<td>100.0%</td>
</tr>
<tr>
<td>Unclassified</td>
<td>1,000</td>
<td>0</td>
<td>707</td>
<td>0</td>
<td>604</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table One. Representation of the Classification Groups over six lactations**

**Two to Four-year-old lactations**

We have obtained classification, production and TOP (Traits Other Production) raw score statistics for 2004/05, 2005/06 and 2006/07 milking seasons for comparison. This means we have tracked the heifers for three milking seasons, until they have completed the season as a four-year-old. Table Two describes the results found from each classification award from the original group of 2,000 two-year-old heifers classified and unclassified milked for the first season of 2004/05.

Generally, the better the classification the more milk was produced. The Days in Milk (DIM) increased 15 days from the heifers classified Good to the heifers classified Very Good. Milk volume increased from 16.9 litres per day in the Good group (totaling 4,297.5 litres) to 18.2 litres per day (total 4,906.1 litres) in the Very Good group and milk-solids per day (ms/day) also increased in a similar fashion from 1.24kg in the Good group to 1.36kg in the Very Good group. Obviously, as the classification increased the raw scores for Udder Overall (UO) and Dairy Conformation (DC) improved, by described in Figure 1.
The number of heifers classified as two-year-olds in each award section in the sample population accurately reflected the total population as described in Table Three.

After reviewing the information as two-year-olds, the same cows were again selected as three-year-olds to review their progress. Table Four describes their results as three-year-olds. The number of classified cows has reduced from 1,000 to 766 (23%) and unclassified reduced to 707 (29%) due to attrition caused by culling, illness or accident.

The heifer classified Fair has been culled. Now the group classified Good represent 3.9% of the total population and as a group has produced less milk, with fewer milksolids over fewer days. The Good Plus group represents 81.6% of the total population and the production results sit in the middle. The Very Good group represents 14.5% of the total sample population and is the best all round performing group for production, they produced 1,195 litres more milk (21.1 litres per day) than the group classified Good (20 litres per day). The classified group is producing more on average than the unclassified group.

The third lactation of the sample population is described in Table Five. The classified group and the unclassified group have both reduced by 15% since the previous lactation. Overall the classified group has reduced 35.1% since their first lactation and the unclassified group has reduced 40%.

Production-wise the Very Good group has an increased milk-solids production of 0.09kg per day to the group classified Good. The Good group produced 22.0 litres per day of production compared to the Very Good group that produced 23.3 litres per day for more days. The Good Plus group produced 22.6 litres of milk per day.

Although for the purposes of this study the cows will be kept in the groups they were originally classified in, it is interesting to note that to date 98 cows in the classified group have been re-classified and 63 have moved up a classification including two have now received Excellent awards. Of the non-classified group 93 were classified as three or four-year-olds and have an average classification award of GP84.

**Five-year-old lactation**

Following their fourth lactation as five-year-olds (2007/08 season), overall numbers for both the Classified and Unclassified groups have reduced to half the numbers when they were initially randomly selected as two groups of 1,000 two-year-olds.

Table Six describes the production performance of the classification groups, the overall average performance for the classified group and the non-classified group in their fourth lactation.

The group classified Good represent 2.8% of the sample population of classified cows (original representation as two-year-olds was 4.2%). The Good Plus group represented 83.2% of the sample population (original representation was 83.8%) and the Very Good group represented 14% of the sample population (original representation 11.9%). The representation of the Good group has reduced whereas the representation of the Very Good group has increased. The Good Plus group has remained the same.

The Good group averaged 1.79kg milk-solids per day over the 2007/08 season as five-year-olds; The Good Plus group averaged 1.78kg milk-solids and the Very Good group averaged 1.83kg. For the past three seasons the different classification groups have produced very different milk-solids with the Good Group producing significantly fewer kilograms of milk-solids than the Good Plus group. For the 2007/08 season these two groups have produced the same. The Very Good group has continued the tradition of producing more milk-solids than the other two groups.
Of the original group of classified two-year-olds, 115 cows have been reclassified and 72 moved up a classification including six that have received Excellent awards. Of the unclassified group 104 have been classified as older cows and averaged GP84 with three classified as Excellent.

**Six-year-old lactation**

The 2002-born cows have completed their fifth lactation as six-year-olds in the 2008/09 season. The total number of cows of the classified group has reduced 60% to 404, down 20% from the previous season. The classification groups represented are Good (G) 3.2%, Good Plus (GP) 80% and Very Good (VG) 16.8%.

The unclassified group of cows has reduced to 309 cows, 69% down from the initial group of 1000 cows.

The average classification of the group classified when initially classified in 2004 was GP83. 123 cows have been reclassified and with attrition, have raised the average classification score to GP84. Ten of the cows have been classified Excellent (EX) from an initial classification of two GP84, two VG85, one VG86 and five VG87.

Over the five lactations the Good group has declined from having 4.2% representation of the population to 3.2%. The Good Plus group has a reduced representation within the population for 83.8% to 80.0% and the Very Good group increased from 11.9% to 16.8%.

For the 2008/09 season the Good group produced an average 5,740 litres, 192kg (3.3%) protein and 227kg (4.0%) fat over 227 days earning $2,210.45 based on the Fonterra payment of $5.20 per kilogram of milk-solids. The average production of the Good Plus group for the season was 6,209 litres, 211kg (3.4%) protein and 247kg (4.0%) fat in 245 days earning $2,428.86. The Very Good group earned $2,419.63 by producing 6,187 litres, 210kg (3.4%) protein and 247kg (4.0%) fat in 247 days. Table Seven summarises the average lactation for each classification group.

**Seven-year-old lactation**

The 2002-born cows have completed their sixth lactation as seven-year-olds for the 2009/10 season. The total number of cows from the classified group has reduced to 218, down 54% from last season. The classification groups represented are Good (1.4%), Good Plus (84.4%) and Very Good (14.2%). The unclassified group of cows has reduced 62% from the previous season and a total 88% from initial selection.

The average classification of the group when initially classified in 2004 was GP83, last season the average rose to GP84 with some cows reclassified and attrition contributing to the increase. At the end of the 2009/10 season the average of the cows in the study remains at GP84.

Of the cows remaining in the study 80 have been reclassified and seven of these have risen to be classified as Excellent including two who were initially classified GP84, one from VG85 and four were classified VG87 the first time. Two of the cows in the VG group have been classified EX2.

All three of the remaining classification groups have increased the average classification as they have had members in each group reclassified. The G group (three cows) have improved their average classification from 79 to 80, the GP group have improved from 83 to 84 and the Very Good group have improved their classification average from 85 to 86.

The Good group has declined from representing 4.2% of the population to 1.4% from the initial season. The Good Plus group has maintained a reasonably consistent representation starting at 83.8% of the total population to now representing 84.4% and the Very Good group has increased representation from 11.9% to 14.2%.

It must be noted at this point that 101 more cows actually calved down for the 2009/10 season but were not herd tested or did not receive enough herd tests to contribute to this study. Of these cows five were in the Good group, 83 from the Good Plus group and 13 from the Very Good group.
The average lactations of the three classification groups provide very different results from previous years. Please note that because the numbers have reduced by so much the results can become skewed and be affected by cows with above average results as well as cows with below average results.

For the 2009/10 season the Good group (three cows) produced an average 6,709 litres, 223kg (3.3%) protein, 278kg (4.1%) fat in 263 days and earned $3,063.73 based on the Fonterra milk payment of $6.08 per kilogram of milk-solids. The production of the Good Plus group (184 cows) was 6,574 litres, 224kg (3.4%) protein, 264kg (4.0%) fat in 261 days earning an average $3,033.30 per cow. The Very Good group (31 cows) produced an average 6,372 litres, 223kg (3.5%) protein and 267kg (4.2%) fat in 257 days and earned $3,030.79 per cow.

Table Eight summarises the average lactation for each classification group.

The income range for the Good group was from $3,595 to $2,766, with the median cow earning $2,830. The Good Plus had a wider range of income starting at $6,009 down to $1,491 – the median being $2,996. The income for the Very Good group ranged from $4,855 to $1,412 with the median cow earning $3,159.

Attrition

The two contributing factors to the reduction of the number of cows over the time of the study are 1) permanent and, 2) non-permanent. The permanent factors allude to cows that have died, been culled or sold. The non-permanent factors are animals that are empty (not in-calf) for a season or have not been herd tested.

Of the permanent factors the largest group of animals removed from the study have been culled with a significant proportion of these being culled because they were empty, not in-calf.

An in-depth investigation of the empty rates to see if a particular classification group was empty more often and therefore more likely to be culled than others did not establish any pattern. Season (weather) had a more definite affect on the empty rate with the 2006/07 recording a high empty rate with 30 being culled immediately and of the 60 recorded as empty 100% returned to milk the following season. It was difficult to establish any pattern as some cows are culled immediately and others are carried over and can get in-calf the following season or if they don’t, then culled. There are a number of cows that have been recorded as empty on more than one occasion.

The next highest contributing factor of cows leaving the study permanently is animals that have been recorded as sold but have not been relocated to another herd. The third reason a cow may be removed from the study is death, whether by disease, accident or other.

The non-permanent factors of cows that could be returned to the study are cows recorded as empty (not in-calf) and cows that were not herd tested for a season. The largest contributing factor to the reduction in numbers for this study are animals that were not herd tested or not herd tested enough times to contribute to this study. The results of this study are obtained from an annual production download from which the Performance Register is published. One of the parameters of this download is that every registered cow must have received at least four herd tests. Recently, lower milk payment seasons has seen a number of breeders reduce or exclude herd tests.

Overall Performance

Now the cows have completed their sixth lactation we are certainly getting an overall picture of their performance in the farm dairy and longevity in the herd. The results have supported the theses that a heifer that received a high classification (Good Plus or Very Good) will produce more milk and last longer in the herd than a heifer that receives a lower classification (Fair or Good).

The population that represented the Fair group only lasted one season and the group that represents the Good group has been reduced to three cows. The Good Plus group has maintained a steady representation throughout the study and the Very Good group has increased in representation in the overall population.

Figure Two shows the average income for each classification group for all six lactations. The 2009/10 season was the best production season to date and the second-best income season – the best income season being 2007/08. Generally as the classification and type of the cows improve the income from the animals also improves.
Figure Three describes the average protein and fat production of the different classification groups over the six lactations. As the classification improved the production improved. The Good group produced an average 181kg (3.4%) protein and 213kg (4.0%) fat each lactation. The Good Plus group produced 194kg (3.4%) protein and 229kg (4.0%) fat for each lactation and the Very Good group has produced an average 201kg (3.4%) and 240kg (4.1%) fat per lactation. The Unclassified group produced 183kg (3.4%) protein and 217kg (4.1%) fat for each lactation.

Figure Four describes the total average income earned by each classification group over the last six lactations based on the Fonterra milk payments for each season. The highest earning group overall is the Very Good group having brought in an average $14,483.67. The Good Plus group has earned an average total $13,974.99 and the Good group earned $13,075.37 over the six lactations. The unclassified group has earned an average $13,228.10 over the same period of time, earning $1,255 less than the Very Good group and $899 less than the Good Plus. The unclassified group did bring in $152 more than the Good group. It serves as a reminder that if heifers are classified as two-year-olds, the better type and production cows are identified early and sound breeding decisions can be made to develop and establish a better performing herd.

The Value of Classification

The average cost to have your heifers classified (based on 50 registered heifers in the herd) is $328.00 or $6.56 per cow. This price reflects current prices, including GST, and is not what was charged in 2004 when the sample group was first classified.

For just over $6.50, you can identify good type animals that will bring in a good income and you will be able to use the information to breed and develop families. The question is: What's stopping you?