### Domestic Dairy Semen Sales (1)

<table>
<thead>
<tr>
<th>BREED</th>
<th>2019</th>
<th>2018</th>
<th>%+/-</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOLSTEIN</td>
<td>15,905,670</td>
<td>17,968,092</td>
<td>-11.48%</td>
</tr>
<tr>
<td>JERSEY</td>
<td>2,994,244</td>
<td>3,276,210</td>
<td>-8.61%</td>
</tr>
<tr>
<td>R&amp;W/RED HOLSTEIN</td>
<td>288,239</td>
<td>212,562</td>
<td>35.60%</td>
</tr>
<tr>
<td>HOLSTEIN-RED CARRIER</td>
<td>143,235</td>
<td>219,423</td>
<td>-34.72%</td>
</tr>
<tr>
<td>BROWN SWISS</td>
<td>82,277</td>
<td>89,757</td>
<td>-8.33%</td>
</tr>
<tr>
<td>AYRSHIRE</td>
<td>26,871</td>
<td>28,225</td>
<td>-4.80%</td>
</tr>
<tr>
<td>GUERNSEY</td>
<td>26,604</td>
<td>27,888</td>
<td>-4.54%</td>
</tr>
<tr>
<td>MILKING SHORTHORN</td>
<td>13,463</td>
<td>16,798</td>
<td>-19.85%</td>
</tr>
<tr>
<td>DAIRY CROSSBREED</td>
<td>9,492</td>
<td>23,068</td>
<td>-58.85%</td>
</tr>
<tr>
<td>OTHER DAIRY</td>
<td>7,614</td>
<td>4,529</td>
<td>68.12%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>19,497,709</strong></td>
<td><strong>21,866,532</strong></td>
<td><strong>-10.83%</strong></td>
</tr>
</tbody>
</table>

### Dairy Semen Import Sales (1)

<table>
<thead>
<tr>
<th>BREED</th>
<th>2019</th>
<th>2018</th>
<th>%+/-</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOLSTEIN</td>
<td>119,031</td>
<td>8,869</td>
<td>1242.10%</td>
</tr>
<tr>
<td>NORWEGIAN RED</td>
<td>63,473</td>
<td>74,743</td>
<td>-15.08%</td>
</tr>
<tr>
<td>MONTBELIARDE</td>
<td>31,898</td>
<td>40,648</td>
<td>-21.53%</td>
</tr>
<tr>
<td>JERSEY</td>
<td>30,963</td>
<td>4,309</td>
<td>618.57%</td>
</tr>
<tr>
<td>FLECKVIEH</td>
<td>17,799</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>DAIRY CROSSBREED</td>
<td>11,625</td>
<td>15,338</td>
<td>-24.21%</td>
</tr>
<tr>
<td>SWEDISH RED</td>
<td>11,376</td>
<td>15,755</td>
<td>-27.79%</td>
</tr>
<tr>
<td>OTHER DAIRY</td>
<td>3,020</td>
<td>94</td>
<td>3112.77%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>289,185</strong></td>
<td><strong>159,756</strong></td>
<td><strong>81.02%</strong></td>
</tr>
</tbody>
</table>

### Custom Frozen Dairy Semen (1)

<table>
<thead>
<tr>
<th>BREED</th>
<th>2019</th>
<th>2018</th>
<th>%+/-</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOLSTEIN</td>
<td>1,256,884</td>
<td>2,008,126</td>
<td>-37.41%</td>
</tr>
<tr>
<td>JERSEY</td>
<td>79,757</td>
<td>354,257</td>
<td>-77.49%</td>
</tr>
<tr>
<td>BROWN SWISS</td>
<td>50,924</td>
<td>119,492</td>
<td>-57.38%</td>
</tr>
<tr>
<td>HOLSTEIN-RED CARRIER</td>
<td>50,809</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>GUERNSEY</td>
<td>19,903</td>
<td>5,499</td>
<td>261.94%</td>
</tr>
<tr>
<td>R&amp;W/RED HOLSTEIN</td>
<td>17,987</td>
<td>11,857</td>
<td>51.70%</td>
</tr>
<tr>
<td>SWEDISH RED</td>
<td>9,819</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>FLECKVIEH</td>
<td>8,231</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>AYRSHIRE</td>
<td>3,329</td>
<td>6,042</td>
<td>-44.90%</td>
</tr>
<tr>
<td>MILKING SHORTHORN</td>
<td>1,575</td>
<td>579</td>
<td>172.02%</td>
</tr>
<tr>
<td>OTHER DAIRY</td>
<td>2,442</td>
<td>13,172</td>
<td>-81.46%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,501,660</strong></td>
<td><strong>2,519,024</strong></td>
<td><strong>-40.39%</strong></td>
</tr>
</tbody>
</table>
### DAIRY SEMEN EXPORT SALES (1)

#### UNITS OF SEMEN

<table>
<thead>
<tr>
<th>BREED</th>
<th>2019</th>
<th>2018</th>
<th>%+/−</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOLSTEIN</td>
<td>23,174,565</td>
<td>22,383,335</td>
<td>3.53%</td>
</tr>
<tr>
<td>JERSEY</td>
<td>1,325,373</td>
<td>1,287,746</td>
<td>2.92%</td>
</tr>
<tr>
<td>R&amp;W/RED HOLSTEIN</td>
<td>523,243</td>
<td>437,831</td>
<td>19.51%</td>
</tr>
<tr>
<td>HOLSTEIN-RED CARRIER</td>
<td>223,048</td>
<td>141,906</td>
<td>57.18%</td>
</tr>
<tr>
<td>BROWN SWISS</td>
<td>186,136</td>
<td>218,843</td>
<td>-14.95%</td>
</tr>
<tr>
<td>AYRSHIRE</td>
<td>77,233</td>
<td>58,642</td>
<td>31.70%</td>
</tr>
<tr>
<td>MONTBELIARDE</td>
<td>10,153</td>
<td>12,713</td>
<td>-20.14%</td>
</tr>
<tr>
<td>GUERNSEY</td>
<td>8,195</td>
<td>12,285</td>
<td>-33.29%</td>
</tr>
<tr>
<td>DAIRY CROSSBREED</td>
<td>4,600</td>
<td>3,914</td>
<td>17.53%</td>
</tr>
<tr>
<td>MILKING SHORTHORN</td>
<td>1,561</td>
<td>2,012</td>
<td>-22.42%</td>
</tr>
<tr>
<td>OTHER DAIRY</td>
<td>986</td>
<td>1,189</td>
<td>-17.07%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>25,535,093</strong></td>
<td><strong>24,560,416</strong></td>
<td><strong>3.97%</strong></td>
</tr>
</tbody>
</table>

### DAIRY SEMEN EXPORT SALES (2)

#### UNITS OF SEMEN

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2018</th>
<th>%+/−</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WORLD TOTAL</strong></td>
<td><strong>26,499,994</strong></td>
<td><strong>24,339,896</strong></td>
<td><strong>8.87%</strong></td>
</tr>
</tbody>
</table>

### DAIRY SEMEN EXPORT SALES (2)

#### DOLLAR VALUE

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2018</th>
<th>%+/−</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WORLD TOTAL</strong></td>
<td><strong>$203,586,082</strong></td>
<td><strong>$186,666,694</strong></td>
<td><strong>9.06%</strong></td>
</tr>
</tbody>
</table>
### Domestic Beef Semen Sales (1)

#### Units of Semen

<table>
<thead>
<tr>
<th>BREED</th>
<th>2019</th>
<th>2018</th>
<th>%+/−</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANGUS</td>
<td>3,171,338</td>
<td>2,400,214</td>
<td>32.13%</td>
</tr>
<tr>
<td>LIMOUSIN</td>
<td>783,344</td>
<td>501,706</td>
<td>56.14%</td>
</tr>
<tr>
<td>SIMMENTAL</td>
<td>773,200</td>
<td>570,054</td>
<td>35.64%</td>
</tr>
<tr>
<td>CROSSBREED</td>
<td>542,294</td>
<td>114,106</td>
<td>375.25%</td>
</tr>
<tr>
<td>CHAROLAIS</td>
<td>222,077</td>
<td>78,353</td>
<td>183.43%</td>
</tr>
<tr>
<td>RED ANGUS</td>
<td>144,924</td>
<td>142,192</td>
<td>1.92%</td>
</tr>
<tr>
<td>POLLED HEREFORD</td>
<td>106,671</td>
<td>81,883</td>
<td>30.27%</td>
</tr>
<tr>
<td>WAGYU</td>
<td>33,939</td>
<td>27,788</td>
<td>22.14%</td>
</tr>
<tr>
<td>HEREFORD</td>
<td>14,483</td>
<td>25,229</td>
<td>-42.59%</td>
</tr>
<tr>
<td>GELBVIEH</td>
<td>7,908</td>
<td>37,364</td>
<td>-78.84%</td>
</tr>
<tr>
<td>BRAHMAN</td>
<td>6,045</td>
<td>8,424</td>
<td>-28.24%</td>
</tr>
<tr>
<td>MAINE ANJOU</td>
<td>5,949</td>
<td>6,219</td>
<td>-4.34%</td>
</tr>
<tr>
<td>BRANGUS</td>
<td>4,515</td>
<td>4,840</td>
<td>-6.71%</td>
</tr>
<tr>
<td>GYR</td>
<td>2,569</td>
<td>2,715</td>
<td>-5.38%</td>
</tr>
<tr>
<td>CHIANINA</td>
<td>2,234</td>
<td>3,844</td>
<td>-41.88%</td>
</tr>
<tr>
<td>BRAHMAN (RED)</td>
<td>2,023</td>
<td>782</td>
<td>158.70%</td>
</tr>
<tr>
<td>SHORTHORN</td>
<td>1,964</td>
<td>2,817</td>
<td>-30.28%</td>
</tr>
<tr>
<td>OTHER BEEF (a)</td>
<td>3,789</td>
<td>27,996</td>
<td>-86.47%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,829,266</strong></td>
<td><strong>4,036,526</strong></td>
<td><strong>44.41%</strong></td>
</tr>
</tbody>
</table>


### Beef Semen Import Sales (1)

#### Units of Semen

<table>
<thead>
<tr>
<th>BREED</th>
<th>2019</th>
<th>2018</th>
<th>%+/−</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANGUS</td>
<td>955</td>
<td>40</td>
<td>2287.50%</td>
</tr>
<tr>
<td>PIEDMONTESI</td>
<td>499</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>RED DANE</td>
<td>132</td>
<td>208</td>
<td>-36.54%</td>
</tr>
<tr>
<td>OTHER BEEF (b)</td>
<td>15</td>
<td>12</td>
<td>25.00%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,601</strong></td>
<td><strong>260</strong></td>
<td><strong>515.77%</strong></td>
</tr>
</tbody>
</table>

(b) Other Beef includes: Limousin and Texas Longhorn.
## BEEF SEMEN EXPORT SALES (1)

### UNITS OF SEMEN

<table>
<thead>
<tr>
<th>BREED</th>
<th>2019</th>
<th>2018</th>
<th>%+/-</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANGUS</td>
<td>4,597,267</td>
<td>3,329,223</td>
<td>38.09%</td>
</tr>
<tr>
<td>RED ANGUS</td>
<td>236,635</td>
<td>284,788</td>
<td>-16.91%</td>
</tr>
<tr>
<td>BRANGUS</td>
<td>108,068</td>
<td>78,736</td>
<td>37.25%</td>
</tr>
<tr>
<td>POLLED HEREFORD</td>
<td>89,943</td>
<td>66,926</td>
<td>34.39%</td>
</tr>
<tr>
<td>SIMMENTAL</td>
<td>88,945</td>
<td>65,444</td>
<td>35.91%</td>
</tr>
<tr>
<td>CROSSBREED</td>
<td>46,037</td>
<td>6,299</td>
<td>630.86%</td>
</tr>
<tr>
<td>CHAROLAIS</td>
<td>41,558</td>
<td>28,179</td>
<td>47.48%</td>
</tr>
<tr>
<td>BRAHMAN (RED)</td>
<td>32,810</td>
<td>23,390</td>
<td>40.27%</td>
</tr>
<tr>
<td>WAGYU</td>
<td>27,097</td>
<td>8,702</td>
<td>211.39%</td>
</tr>
<tr>
<td>BRANGUS (RED)</td>
<td>16,458</td>
<td>6,891</td>
<td>138.83%</td>
</tr>
<tr>
<td>GYR</td>
<td>16,087</td>
<td>17,909</td>
<td>-10.17%</td>
</tr>
<tr>
<td>BRAHMAN</td>
<td>15,437</td>
<td>19,343</td>
<td>-20.19%</td>
</tr>
<tr>
<td>LIMOUSIN</td>
<td>10,425</td>
<td>19,022</td>
<td>-45.20%</td>
</tr>
<tr>
<td>OTHER BEEF (c)</td>
<td>6,723</td>
<td>22,283</td>
<td>-69.83%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>5,333,490</strong></td>
<td><strong>3,977,135</strong></td>
<td>34.10%</td>
</tr>
</tbody>
</table>


## BEEF SEMEN EXPORT SALES (2)

### UNITS OF SEMEN

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2018</th>
<th>%+/-</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WORLD TOTAL</strong></td>
<td><strong>5,771,728</strong></td>
<td><strong>3,741,667</strong></td>
<td>54.26%</td>
</tr>
</tbody>
</table>

## BEEF SEMEN EXPORT SALES (2)

### DOLLAR VALUE

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2018</th>
<th>%+/-</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WORLD TOTAL</strong></td>
<td><strong>$16,228,611</strong></td>
<td><strong>$13,292,981</strong></td>
<td>22.08%</td>
</tr>
</tbody>
</table>
### CUSTOM FROZEN BEEF SEMEN (1)
#### UNITS OF SEMEN

<table>
<thead>
<tr>
<th>BREED</th>
<th>2019</th>
<th>2018</th>
<th>%+/−</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANGUS</td>
<td>1,239,893</td>
<td>1,088,935</td>
<td>13.86%</td>
</tr>
<tr>
<td>SIMMENTAL</td>
<td>639,203</td>
<td>426,924</td>
<td>49.72%</td>
</tr>
<tr>
<td>WAGYU</td>
<td>160,938</td>
<td>128,365</td>
<td>25.38%</td>
</tr>
<tr>
<td>CROSSBREED</td>
<td>145,518</td>
<td>137,441</td>
<td>5.88%</td>
</tr>
<tr>
<td>CHAROLAIS</td>
<td>142,570</td>
<td>58,538</td>
<td>143.55%</td>
</tr>
<tr>
<td>BEEFMASTER</td>
<td>115,808</td>
<td>104,841</td>
<td>10.46%</td>
</tr>
<tr>
<td>RED ANGUS</td>
<td>83,767</td>
<td>205,249</td>
<td>-59.19%</td>
</tr>
<tr>
<td>BRANGUS</td>
<td>71,131</td>
<td>71,729</td>
<td>-0.83%</td>
</tr>
<tr>
<td>POLLED HEREFORD</td>
<td>68,751</td>
<td>85,149</td>
<td>-19.26%</td>
</tr>
<tr>
<td>BRAHMAN</td>
<td>50,098</td>
<td>60,009</td>
<td>-16.52%</td>
</tr>
<tr>
<td>HEREFORD</td>
<td>46,557</td>
<td>56,210</td>
<td>-17.17%</td>
</tr>
<tr>
<td>GELBVIEH</td>
<td>43,576</td>
<td>72,821</td>
<td>-40.16%</td>
</tr>
<tr>
<td>SANTA GERTRUDIS</td>
<td>29,156</td>
<td>12,920</td>
<td>125.67%</td>
</tr>
<tr>
<td>AMERICAN BREED</td>
<td>27,459</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>LIMOUSIN</td>
<td>23,837</td>
<td>737,037</td>
<td>-96.77%</td>
</tr>
<tr>
<td>SHORTHORN</td>
<td>21,366</td>
<td>26,157</td>
<td>-18.32%</td>
</tr>
<tr>
<td>RED BRANGUS</td>
<td>20,770</td>
<td>2,979</td>
<td>597.21%</td>
</tr>
<tr>
<td>CHI-MAINE</td>
<td>19,061</td>
<td>10,892</td>
<td>75.00%</td>
</tr>
<tr>
<td>BELGIAN BLUE</td>
<td>18,831</td>
<td>16,135</td>
<td>16.71%</td>
</tr>
<tr>
<td>BRAHMAN (RED)</td>
<td>18,524</td>
<td>5,006</td>
<td>270.04%</td>
</tr>
<tr>
<td>MAINE ANJOU</td>
<td>17,086</td>
<td>40,323</td>
<td>-57.63%</td>
</tr>
<tr>
<td>AMERICAN BUCKING BULL</td>
<td>14,797</td>
<td>11,493</td>
<td>28.75%</td>
</tr>
<tr>
<td>CHIANINA</td>
<td>14,025</td>
<td>36,701</td>
<td>-61.79%</td>
</tr>
<tr>
<td>SHORTHORN (SCOTCH)</td>
<td>8,879</td>
<td>12,894</td>
<td>-31.14%</td>
</tr>
<tr>
<td>DUTCH BELTED</td>
<td>8,414</td>
<td>8,737</td>
<td>-3.70%</td>
</tr>
<tr>
<td>TEXAS LONGHORN</td>
<td>7,905</td>
<td>15,333</td>
<td>-48.44%</td>
</tr>
<tr>
<td>SALERS</td>
<td>5,409</td>
<td>3,883</td>
<td>39.30%</td>
</tr>
<tr>
<td>BRAUNVIEH</td>
<td>5,631</td>
<td>3,247</td>
<td>73.42%</td>
</tr>
<tr>
<td>BLACK HEREFORD</td>
<td>5,411</td>
<td>13,114</td>
<td>-58.74%</td>
</tr>
<tr>
<td>ABERDEEN</td>
<td>5,238</td>
<td>8,898</td>
<td>-41.13%</td>
</tr>
<tr>
<td>BRITISH WHITE</td>
<td>4,463</td>
<td>250</td>
<td>1685.20%</td>
</tr>
<tr>
<td>SIMBRAH</td>
<td>3,971</td>
<td>3,711</td>
<td>7.01%</td>
</tr>
<tr>
<td>AMERICAN AKAUSHI</td>
<td>3,142</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>SOUTH DEVON</td>
<td>2,456</td>
<td>6,500</td>
<td>-62.22%</td>
</tr>
<tr>
<td>PIEDMONTESI</td>
<td>1,389</td>
<td>4,981</td>
<td>0.00%</td>
</tr>
<tr>
<td>OTHER BEEF (d)</td>
<td>26,339</td>
<td>196,653</td>
<td>-86.61%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>3,121,369</strong></td>
<td><strong>3,674,055</strong></td>
<td><strong>-15.04%</strong></td>
</tr>
</tbody>
</table>


(1) Based on Quarterly Reports of Semen Sold and Custom Frozen

(2) Based on Quarterly Survey of Semen Sold for Export