Genetic results from the Strain Trials

J.R. Roche
Disclaimer

I know little about animal breeding and am quite happy to leave it to the “professional animal breeder”

But only if they stop making a botch of it by selecting for single production traits
High Yielding Cows

% Energy in milk

% Energy in maintenance

kg MS/cow/yr

0% 25% 50% 75% 100%

370 470 508 696 773
1. Has genetic improvement resulted in a more efficient cow? (i.e. does she produce more milk) YES!
Top United States Cows

Muranda Oscar Lucinda-ET  
Floyd & Lloyd Baumann & Fred Lang  
Marathon, WI  
Completed November 1997  
30,870 kg milk 2x 365-day  
2,161 kg Fat and Protein (est.)

Robthom Suzet Paddy  
Robert M. Thomson Jr., Springfield, MO  
Completed August 1993  
26,955 kg milk 2x 365-day  
1,887 kg Fat and Protein (est.)
Estimated milk yields by breed
(1998 birth year; USDA)

- Data compliments of Dr. Steve Washburn, University of North Carolina
% US genetics in NZ HF cows

(Harris 2000)
So genetic improvement has resulted in a more efficient cow? But ...... is she sustainable? ...... is she most profitable?

And is the same cow appropriate in every system?
Milk yield
NZ better on pasture, US better on TMR
<table>
<thead>
<tr>
<th>Year</th>
<th>NZ</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>7\textsubscript{(1)}</td>
<td>10\textsubscript{(1)}</td>
</tr>
<tr>
<td>Year 2</td>
<td>14\textsubscript{(2)}</td>
<td>21\textsubscript{(3)}</td>
</tr>
<tr>
<td>Year 3</td>
<td>14\textsubscript{(2)}</td>
<td>14\textsubscript{(2)}</td>
</tr>
</tbody>
</table>

% not in calf
% not in calf - US poor on pasture

<table>
<thead>
<tr>
<th>Year</th>
<th>Pasture NZ</th>
<th>Pasture US</th>
<th>TMR NZ</th>
<th>TMR US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>0</td>
<td>22 (2)</td>
<td>7 (1)</td>
<td>10 (1)</td>
</tr>
<tr>
<td>Year 2</td>
<td>7 (1)</td>
<td>38 (5)</td>
<td>14 (2)</td>
<td>21 (3)</td>
</tr>
<tr>
<td>Year 3</td>
<td>7 (1)</td>
<td>62 (8)</td>
<td>14 (2)</td>
<td>14 (2)</td>
</tr>
</tbody>
</table>

So which cow is most efficient?
Estimated milk yields by breed
(1998 birth year; USDA)

- Data compliments of Dr. Steve Washburn, University of North Carolina
Estimated productive life in months by breed (1998 birth year; USDA)

- Data compliments of Dr. Steve Washburn, University of North Carolina
Genetics, Nutrition, Management

Milk Production Per Cow
Genetics, Nutrition, Management

Milk Production Per Cow

Reproduction
Days open trends over 25 years

- Data compliments of Dr. Steve Washburn, University of North Carolina
Services per conception trends

- Data compliments of Dr. Steve Washburn, University of North Carolina
“Cows for Courses?”
Has genetic progress delivered benefits?

YES
Benefits

• 18% more milksolids/cow, more protein:fat, more concentrated milk, more efficient converter of feed into profits

• Large increase in profit consistent with differences in genetic merit (for profit)
**NZ70 vs. NZ90**

<table>
<thead>
<tr>
<th></th>
<th>Average profit US$/ac</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NZ70’s</strong></td>
<td></td>
</tr>
<tr>
<td>$BW -20</td>
<td>$608</td>
</tr>
<tr>
<td><strong>NZ90’s</strong></td>
<td></td>
</tr>
<tr>
<td>$BW 138</td>
<td>$734</td>
</tr>
<tr>
<td><strong>Difference</strong></td>
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</tr>
<tr>
<td></td>
<td>$126/acre</td>
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</table>
Genetic improvement does result in a more economically efficient cow?

BUT
# NZ90 vs. OS90

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<tr>
<td>NZ90’s</td>
<td>$734</td>
</tr>
<tr>
<td>$BW 138</td>
<td></td>
</tr>
<tr>
<td>US90’s</td>
<td>$660</td>
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<tr>
<td>$BW 112</td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>$74/ac</td>
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</tbody>
</table>
Response to concentrate
(average of 2 years)

<table>
<thead>
<tr>
<th></th>
<th>6.4lb</th>
<th>12.8lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ HF</td>
<td>0.68</td>
<td>0.48</td>
</tr>
<tr>
<td>US HF</td>
<td>0.96</td>
<td>0.89</td>
</tr>
</tbody>
</table>
NZ cows – linear BCS response to concentrates

![Graph showing BCS response to days in milk for NZ cows. The graph includes three lines representing different BCS changes: 12.8 lb, 6.4 lb, and 0 lb. The x-axis represents days in milk, ranging from 0 to 300, and the y-axis represents BCS ranging from 3.5 to 6.0. Each line indicates a linear increase in BCS with an increase in days in milk, starting from different initial BCS values.]
US cows – continue to milk
Until high level of concentrates

Days in milk

BCS

12.8 lb

0 lb

6.4 lb
“Cows for Courses?”
Remember the Economics

[Image of a cow with a dollar sign]
Tips for cow selection

- Seek advice of an interested dairy geneticist
- Consider traits of economic importance in your herd
- Select breeds to complement each other
- Plan for several generations beyond the first cross
- Select breeding stock with performance records
- Select from populations measured for traits of value
- Avoid the “breed of the year" syndrome

- Steve Washburn, University of North Carolina
Making the Difference in Dairying