Feed intake recording on commercial farms for high reliable breeding values

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The importance of feed efficiency

**Lower feed costs**
The costs of the feed ration account for approx. 60% of all the variable costs involved in milk production. Breeding for feed efficiency saves on average 10% on feed costs.

**A positive impact on the environment**
By reducing greenhouse gas emissions and the use of scarce resources.
LIFE WEIGHT AND FEED EFFICIENCY

- Over the past 30 years, our cows have grown about 4 cm and are 50 kg heavier. Trend still shows an increase in height size and weight. Average NL/VL adult cow weighs about 658 kg and are 150 cm height. **Heavier cows need about 1.0 - 1.5 kg dm of feed per day extra per 100 kg of body weight.**
Example Milk production and feed intake.

<table>
<thead>
<tr>
<th>Cow</th>
<th>Kg Milk* in 3 lact.</th>
<th>Life weight adult cow</th>
<th>Kg. dm. feedintake</th>
<th>feed efficiency</th>
<th>Profit per cow in euro’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>30.140</td>
<td>660</td>
<td>26.898</td>
<td>1.13</td>
<td>5170</td>
</tr>
<tr>
<td>B</td>
<td>30.287</td>
<td>634</td>
<td>21.887</td>
<td>1.39</td>
<td>6223</td>
</tr>
<tr>
<td>C</td>
<td>30.802</td>
<td>650</td>
<td>20.143</td>
<td>1.54</td>
<td>6752</td>
</tr>
<tr>
<td>D</td>
<td>30.408</td>
<td>618</td>
<td>18.552</td>
<td>1.65</td>
<td><strong>6932</strong></td>
</tr>
</tbody>
</table>

*Kg FPCM  ** Milk price € 0.35 - Feed costs € 0.20 kg/dm

Difference in DM intake

Cow D +34% more profit compared to A.
When will it be succesfull?

- Breeding values should have high reliabilities.

- Feed intake recording on a large scale
  - Lactating cows
  - 1, 2 and 3th lactation

- Don’t wait till you have solved all problems

- Don’t wait till everybody will join.

- You have to invest a lot of money
COLLECTION OF FEED RECORDING DATA

5 Commercial farms

- Aug. 2017 Alders, Overloon 200 cows 20 bins
- Mar. 2019 Gastel, Nispen 150 cows 20 bins
- Sept. 2019 Vroege, Dalen 1.200 cows 84 bins
- Nov. 2019 Duursma, Bellingw. 300 cows 46 bins
- Dec. 2019 Meerkerk, Em Com 230 cows 30 bins

5 Research farms.

In total CRV is measuring 2,500 cows a year for feed intake.
In total now 10,000 cows with feed intake data.( dec 2022)
Different feedbins on different farms.
Data collection.

- Individual feed intake (roughage and concentrate) Control group
- Milk production 2-3 x daily (comp. via Milk rec) All cows
- Body weight (2 x daily) / Body condition score All cows
- Water intake Control group
- Health traits and claw health (DigiClaw) All cows
- Rumination/laying & eating time All cows
- Fertility (Ovalert) All cows
- Measuring Methane emissions (3 farms)
- All farms using at least 80% young CRV bulls.
Feed intake recording individual cows since 1990
Since 2017, CRV has been measuring individual feed intake of > 2,500 cows per year on multiple test farms.

What did we find?

- Measured variation between cows:
  - Within one company: 1.46 kg milk
  - Lowest ones: 1.1 kg of milk
  - Highest ones: 2.2 kg melk

Feed efficiency = \( \frac{\text{kg of milk produced}}{\text{kg of dry matter}} \)

1 kg milk = kg measuring milk with 4.00% fat and 3.30% protein
<table>
<thead>
<tr>
<th></th>
<th>Feed efficiency</th>
<th>Body weight</th>
<th>Milk1 production</th>
<th>Dry matter intake</th>
<th>Concentrates / kg milk1</th>
<th>Profit per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>25% best for FE</td>
<td>1,87</td>
<td>676 kg</td>
<td>42,2 kg</td>
<td>22,6 kg</td>
<td>220 gram</td>
<td>€ 10,24</td>
</tr>
<tr>
<td>25% least for FE</td>
<td>1,38</td>
<td>697 kg</td>
<td>32,5 kg</td>
<td>23,5 kg</td>
<td>270 gram</td>
<td>€ 6,86</td>
</tr>
<tr>
<td>Difference</td>
<td>0,5</td>
<td>- 21 kg</td>
<td>9,7 kg</td>
<td>- 0,9 kg</td>
<td>- 50 gr.</td>
<td>+ € 3,38</td>
</tr>
</tbody>
</table>

25% best cows: 49% more profit

1 kg melk = kg meetmelk met 4,00% vet en 3,30% eiwit

2 Melkprijs € 0,35 Krachtvoer prijs € 0,27 Ruwvoer prijs € 0,15
The 25% best cows for feed efficiency in the herd need a quarter less feed for the same amount of FPCM milk as the 25% lowest cows for feed efficiency. So less feed costs, less methane emissions and less manure.
Breeding value Feed efficiency

What can breeding mean in this?

A bull with a breeding value 108 Feed efficiency gives offspring with +400 kg of milk*

* with a production of 10,000 kg of milk/1/year and the same ration

EITHER With the same production you save 15,600 euros feed costs (3)

AND IN DOING SO 4% less methane emissions per kg of milk

<table>
<thead>
<tr>
<th>Breeding value</th>
<th>Feed efficiency</th>
<th>Milk(^1) per kg/dm feed</th>
<th>Kg milk(^1)/cow with the same amount of feed</th>
<th>Extra milk income with the same feed costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>108</td>
<td></td>
<td>+4%</td>
<td>10,400</td>
<td>€ 40,000</td>
</tr>
</tbody>
</table>

\(^1\) kg milk = kg FPCM with 4,00% fat and 3,30% protein
\(^2\) Milk price / kg FPCM Milk 0,50 €
\(^3\) Concentrates 0,38 €/kg, Raufase price 0,22 €/kg
Reliable Breeding values

Proven bulls:
Reliabilities breeding value from 65% to 85 %

Young Genomic bulls:
Reliabilities from 50% to 54 %
Proven bulls with numbers of daughters with feed intake data December 22.

<table>
<thead>
<tr>
<th>Bull</th>
<th>Daughters with feed intake data</th>
<th>% Rel. BV FE</th>
<th>BV FE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esperanto</td>
<td>73</td>
<td>80</td>
<td>110</td>
</tr>
<tr>
<td>Lendor</td>
<td>69</td>
<td>75</td>
<td>106</td>
</tr>
<tr>
<td>Final</td>
<td>64</td>
<td>82</td>
<td>103</td>
</tr>
<tr>
<td>Danno</td>
<td>146</td>
<td>85</td>
<td>102</td>
</tr>
<tr>
<td>Ranger</td>
<td>99</td>
<td>77</td>
<td>102</td>
</tr>
<tr>
<td>Finder</td>
<td>31</td>
<td>79</td>
<td>102</td>
</tr>
<tr>
<td>Jupiler</td>
<td>164</td>
<td>82</td>
<td>102</td>
</tr>
<tr>
<td>Magister</td>
<td>141</td>
<td>82</td>
<td>101</td>
</tr>
<tr>
<td>Atlantic</td>
<td>122</td>
<td>87</td>
<td>97</td>
</tr>
<tr>
<td>Rocky</td>
<td>52</td>
<td>80</td>
<td>95</td>
</tr>
</tbody>
</table>
Quantity of offspring and % reliability BV feedefficiency
18 Bulls with ≥ 106 BV Feed Efficiency available.

<table>
<thead>
<tr>
<th>NVI</th>
<th>Fertility</th>
<th>udder health</th>
<th>Claw health</th>
<th>Longevity</th>
<th>Methane Eff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>327</td>
<td>104</td>
<td>105</td>
<td>105</td>
<td>604</td>
<td>106</td>
</tr>
<tr>
<td>Kg Milk</td>
<td>% Fat</td>
<td>% Protein</td>
<td>Calving ease</td>
<td>Ketosis</td>
<td>Feed efficiency</td>
</tr>
<tr>
<td>1461</td>
<td>,14</td>
<td>,14</td>
<td>102</td>
<td>106</td>
<td>107</td>
</tr>
</tbody>
</table>

D. Endless RF

D. Flagstone
Thank you
Selection on lifetime efficiency

CRV VIEW ON EFFICIENCY

LIFETIME MILK PRODUCTION = CRV EFFICIENCY

LIFETIME FEED INTAKE

YOUNGSTOCK

LACTATION 1, 2, 3+

LACTATION 1, 2, 3+