Consequences of a simplified milk recording method on estimation of lactation yields and genetic evaluations for dairy traits in goats


1st June 2012
Introduction

3 official methods:
A: 48 %
AZ: 6 %
AT: 46 %

trend to simplify methods

⇒ search for a more simplified method based on spacing records
Aim of the study

Simulation of a simplified method called "3 records"

Evaluation:
1) application on farm
2) consequences on estimated performances
3) consequences on estimated breeding values (EBV)
Material and methods

Dairy production

Days in milk

ANIMAL

HERD

70 190

Span time = 4 months

high h²
high correlation (test-day, lactation)

Kidding 1st animal

Kidding last animal
Material and methods

- **French region with only AT method**
  - 30% of herds
  - 90% of herds

- **French region with mainly A method**
  - 30% of herds
  - 90% of herds

- **France (A + AT)**
  - 30% of herds
  - 60% of herds

- **For 1 or 4 years**
Material and methods

- Estimation of dairy traits with Fleischmann's method:
  - milk yield
  - protein yield
  - fat yield
  - protein content
  - fat content

- Extrapolation for a reference lactation of 250 days

- Computing of bias and loss of accuracy (1 – R²)
Material and methods

- Genetic evaluation with data from simplified method and official data
- Comparaison of EBVs with official EBVs
Results and discussion

<table>
<thead>
<tr>
<th>Variables</th>
<th>Bias (%)</th>
<th>Loss of accuracy (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>8,5</td>
<td>13</td>
</tr>
<tr>
<td>Fat yield</td>
<td>3,5</td>
<td>15</td>
</tr>
<tr>
<td>Protein yield</td>
<td>4,2</td>
<td>14</td>
</tr>
<tr>
<td>Fat content</td>
<td>-4,1</td>
<td>25</td>
</tr>
<tr>
<td>Protein content</td>
<td>-3,8</td>
<td>16</td>
</tr>
</tbody>
</table>
Results and discussion

Factors having significant effect on biases:

- herd
- level of production of animals
- month of kidding
- number of records of the initial method
- proportion of a.m. records

![Bar graph showing fat content comparison between more a.m. and more p.m. records. The graph shows a significant difference in fat content.](image-url)
Results and discussion

Correlation EBV with simplified method / official EBV: 0.99

Correlation by parity:

<table>
<thead>
<tr>
<th>Parity</th>
<th>Corrélations AT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.93</td>
</tr>
<tr>
<td>2</td>
<td>0.98</td>
</tr>
<tr>
<td>3 and +</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Few re-rankings intra-herd
Results and discussion

Consequences on dams of bucks:

<table>
<thead>
<tr>
<th>Dams of bucks</th>
<th>1 year</th>
<th>4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AT region (90%)</td>
<td>A region (90%)</td>
</tr>
<tr>
<td>% of replaced females</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Variation of total merit index on new females</td>
<td>+ 0.56</td>
<td>+ 0.47</td>
</tr>
</tbody>
</table>
Results and discussion

Consequences on AI bucks:

- Official EBVs
- EBVs estimated with some lactations in simplified method (60% France)

![Graph showing comparison between official EBVs and EBVs estimated with simplified method.](image-url)
Conclusions

- Difficulty to implement the model in practice
- Bias especially for milk
- Loss of accuracy in particular for fat content and for AT method

To improve performances estimation:
- Keeping the same number of a.m. and p.m. records for AT method
- Revision of extrapolation methods
- Use of adjustment factors based on milking intervals
Conclusions

Impact on selection scheme in re-ranking reproducers

- A weight depending on the accuracy of the method to reduce the importance of simplified methods in genetic evaluation
- Implementation of genetic evaluation based on test-day model
Thank for your attention