Session 3

From Milk Recorder to Bulk Tank:

Understanding The Factors Affecting Consistency In Fat & Protein Reporting

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Background

Milk Recording

Reporting

Breeding Values

Dairy Processor Bulk Collections

Reporting

Milk Price calculation

**AgTech – it’s in our DNA**
Aims

1. Quantify the actual level of discrepancies in fat and Protein %

2. Identify the factors which contribute to these discrepancies
icbf Database
Analysis

Milk Recording
Test Day Average

Database

- Data from 2023
- Minimum of 4 Milk Recordings

Dairy Processor
Bulk Averages

Pearson Correlation

Positive Correlation
Negative Correlation
No Correlation

RMSE
Analysis

Pearson Correlation

\[(r)\]

Positive Correlation: \( r \approx 1 \)
Negative Correlation: \( r \approx -1 \)
No Correlation: \( r \approx 0 \)

RMSE

\[ \text{RMSE} \]
Results

Fat & Protein Percent - Milk Recording & Bulk

<table>
<thead>
<tr>
<th>Source</th>
<th>Correlation</th>
<th>RMSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat</td>
<td>0.86</td>
<td>0.47</td>
</tr>
</tbody>
</table>
Results

<table>
<thead>
<tr>
<th>Fat %</th>
<th>Correlation</th>
<th>RMSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same Day Milk Recording - Bulk</td>
<td>0.86</td>
<td>0.35</td>
</tr>
<tr>
<td>Mean 3 Bulks Before</td>
<td>0.84</td>
<td>0.35</td>
</tr>
<tr>
<td>Mean 3 Bulks After</td>
<td>0.83</td>
<td>0.42</td>
</tr>
</tbody>
</table>
Results

<table>
<thead>
<tr>
<th>Meter Type</th>
<th>Correlation</th>
<th>RMSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDIY</td>
<td>0.89</td>
<td>0.36</td>
</tr>
<tr>
<td>Manual</td>
<td>0.82</td>
<td>0.35</td>
</tr>
</tbody>
</table>

Histogram of Fat % Residuals (Milk Recording - Bulk)

- **EDIY**: > 90% Underestimated
- **Manual**: ~ 70% Underestimated
Results

There's no silver bullet
Discussion

1. Are we really comparing like with like?
   • Trying to align the sampling of a bulk tank which often contains multiple milkings to a single milk recording.

2. Assuming bulk tank sampling is the gold standard?
   • What are the factors that can influence bulk collection sampling accuracy?

3. What is an acceptable level of error?
   • Is there a level of error that can be accepted?

4. Several contributing factors
   • Large variation in milking meters
   • Need to look deeper
Conclusions

1. On Average, milk recorded fat and protein % is underestimated compared to the bulk tank.

2. Largest discrepancies occur in fat %.

3. Factors such as recording meter type, test day yields and recording season do not easily explain why discrepancies occur.

4. More in-depth analysis needed to investigate impact of on farm factors such as milk recording infrastructure.
What Next?

1. On Farm Trial
   - Identify herds
   - Assess milking machine/meter performance
   - Establish whether linked to inconsistent reporting

2. Test day animal level analysis
   - Dig deeper into test day animal level milk recording data
Our Farmer & Government Representation

An Roinn Talmhaíochta, Bia agus Mara
Department of Agriculture, Food and the Marine

IFA

Our AI & Milk Recording Organisations

Dovea Genetics
Munster Bovine
Progressive Genetics
Tipperary Cooperative

Our Herdbooks

Acknowledging Our Members