Recording of health and fertility to reduce costs

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Increased milk production has been extremely successful through genetic selection and improvements in nutrition and management.

- High yields per cow can be counter-productive
- Inefficiencies due to increased disease, declined fertility and reduced longevity
- A balance between maximising production and minimising costs
Selection indices have evolved worldwide

- In UK - Profitable Lifetime Index
A History: Development of UK dairy indices

- **1990**
  - PIN
    - Milk
    - Fat
    - Protein

- **1995**
  - £PLI
    - PIN
    - Lifespan (dtr. recs.)

- **1999**
  - £PLI
    - PIN
    - £PLI
    - Mastitis (via SCC)
    - Lameness (via loco. and L&F)

- **2003**
  - £PLI
    - PIN
    - £PLI
    - Fertility (via CI & NR56)

- **2006**
  - £PLI
    - PIN
    - £PLI
    - Mastitis (via udder comp)

- **2007**
  - £PLI
    - PIN
    - £PLI
    - Mastitis (via udder comp)

- **2010**
  - £PLI
    - PIN
    - £PLI
    - Mastitis (direct trait)
    - Fertility (incl. later lactations)

- **2012**
  - £PLI (cows & bulls)
    - PIN
    - £PLI
    - Calving Ease PTA’s

- **2012**
  - Addition of Mastitis (direct trait)
    - Fertility (incl. later lactations)

*denotes changes

Increasing Functionality
**Mastitis**

- Currently, indicator traits are used (SCC, Udder Composite)
- Beneficial to include mastitis as a direct trait
- Until now a lack of records
  
  *However, mastitis is recorded voluntarily by farmers as part of their milk recording and herd management*

- Due to the quantity of data available genetic evaluations including mastitis as a direct trait seems feasible
Analysis of mastitis

- Mastitis analysed as either a binary or count trait
- Analysed affected animals and their contemporaries
  - In the same herd-year-season at calving
- Incidence increased with lactation number
  - 14% in lactation 1 to 26% in lactation 3
- Heritability ~ 4 to 5%
- Genetically correlated with indicator traits of mastitis
  - ~0.68 with SCC and 0.28 with udder composite
- Favourable genetic correlation with other functional traits
Genetic trends
- Mean PTA’s for SCC and Mastitis

- Reliabilities for mastitis and SCC at least 30 %
Analysis of mastitis

- Mastitis data might be expected to be poor as recording is optional
- However, incidence levels and genetic parameter estimates were in line with other studies
- Including mastitis as a direct trait in genetic evaluations may bring about a greater effort in recording
The Future

Lameness

• Lameness also a major cost to the dairy industry
• Indicator traits used rather than a direct trait
• Also recorded in a similar way as mastitis, but far fewer records at present!
• Other data which is recorded would be advantageous
  – hoof trimming records
  – mobility data from farm assurance schemes
The Future

Fertility

• Improvements to the Fertility Index
• At present only data from first lactation evaluated

Number of lactations available with fertility data in 2011

<table>
<thead>
<tr>
<th>Lactation Number</th>
<th>Number of animals</th>
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<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>135,205</td>
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<tr>
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<td>73,413</td>
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<td>5</td>
<td>49,016</td>
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</table>
The Future

Fertility

• First lactation is not the only function of fertility
  – Mature cows, maiden heifers, the inseminating sire

• Currently analysing fertility traits as repeated measures across lactations

• Similar heritability estimates as first lactation but would expect an increase in accuracy

• Information is available on maiden heifer fertility, but the feasibility of its use has not yet been investigated
Maiden heifer fertility – 2011 data

- Raw data (only edit age at insemination)
- Over 250,000 heifers with insemination data each year (up until 2011)
- Mean age at first insemination has decreased (2005 = 20.2 months, 2011 = 18.7 months)
Concluding remarks

- Breeding goals and economic conditions change with time
- Functional traits are expected to be always an essential component
• Recent improvements have been made possible through recording done by farmers (Fertility, Calving Ease)

• Using farmer-recorded mastitis data for genetic evaluations appears promising

Mastitis – indirect + direct selection
Fertility – first + later lactations

Improved accuracy of proofs
Reduced Mastitis

- Reduced Costs £
- Improved Fertility
- Reduced Lameness
- Improved Longevity

Reducing Costs

 Fewer Replacements

 More cows reaching full lactation potential

Improving Income
• Encourage recording for herd management purposes
  – Better management decisions
  – Pinpoint problems more easily
  – Made more aware of costs

• Standardised protocols of recording
• **Recording is time consuming**
  – *Should try not to overburden farmers*
  – *But in the long-term should be time-saving*

• **Make best use of existing data**
  – *Capture data from hoof-trimming, mobility scoring etc.*

• **Link sources together**
Thank you for your attention

Acknowledgements

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