Dairy Nitrogen Fertiliser Advisor

Feed Nitrogen Use Efficiency

- Arts et al. 2000
- Chase, 2004
- Castillo et al. 2000
- Kebreab et al. 2001
- Powell et al. 2006
- Gourley et al. 2010

<table>
<thead>
<tr>
<th></th>
<th>N use efficiency (%)</th>
<th>N excreted (g N/cow/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>20.8</td>
<td>432</td>
</tr>
<tr>
<td>Min</td>
<td>10.5</td>
<td>199</td>
</tr>
<tr>
<td>Max</td>
<td>35.1</td>
<td>792</td>
</tr>
</tbody>
</table>
Large variation in feed N intakes

Crude protein content of perennial pastures in Victoria throughout the year. Doyle et al. (2000)
Milk Urea N & Dietary Crude Protein Content

\[ y = 0.17(\pm 0.005)x - 14.2(\pm 0.849) \]

\[ R^2 = 0.778 \]

Courtesy Glen Broderick, USDA-ARS-USDFRC, Madison, WI

(Nousiainen et al., 2004)
Heterogeneous animal excreted N

- 540 cows
- 460 ha
- 1.2 cows/ha
- 42% reliant imported feed

Animal N Loading (kg N/ha/yr)

- 0 - 20
- 21 - 40
- 41 - 60
- 61 - 80
- 81 - 100
- 101 - 120
- 121 - 140
- 141 - 160
- 161 - 180
- 181 - 200
- 201 - 220
- 221 - 240
- 241 - 260
- 261 - 280

SW Victorian dairy farm
Proposed criteria:

1. Describe and simplify the system
2. Scientifically sound and defendable
3. Address multiple goals
   - Productivity (i.e. yield goals)
   - Potential losses to the environment
4. Utilise readily collectable data
5. Scalable
   - Field, farm, industry, regional, national, international
6. Provide guidance for improvement
7. Enable assessment over time
• No one number can convey this complexity.
• Must involve farmers and industry
7th International Nitrogen Conference (INI 2016)
4-8 December 2016
Melbourne Cricket Ground | Victoria | Australia
‘Solutions to Enhance Nitrogen Efficiency for the World’