Historical and future developments in the New Zealand genetic evaluation system for dairy cattle

Jeremy Bryant (NZAEL Manager), Bevin Harris, Peter Amer, Rachel Wood
Key points

- Strong recording and AE history
- New database and shift of animal evaluation to NZAEL
- Traits and research of importance
Trend - Cow Breeding Worth

37% 11% 0.5% 43%
Source of genetic trend - HF

Amer et al 2013
Why the success

• Strong history - recording, herd testing, breeding infrastructure
• History of excellent quantitative geneticists
• Across breed, TDM, fertility BV, genomics
• Index that is economically relevant
• Investment – industry good and company
Current State

- CRV Ambreed
- Interbull
- AEU @ LIC
- Access Panel
- Requests
- AEU @ LIC
- Sire Outputs
- NZAEL
Principles - Transition

1. Utilise national and international experts, organisations and systems
2. Highly modular
3. Utilise business intelligence tools
4. Build deeper teams – genetics and IT
Parentage recording

- Parentage misidentification rates are high
- Likely deflates genetic merit of elite bulls
- Theory: Within herd heritability estimates provide an indication of parentage identification quality and phenotype quality
- Herd heritability vs. sire misidentification
  - $r = -0.38$ to $-0.50$ (Dechow et al. 2008)
Body condition score

- BCS of 5 at calving essential for reproduction
- Animal welfare and public perception
- Economic value ($102/BCS)
  - Utilise cheaper feed in spring rather than winter for replenishment
  - Milk on longer
- Differences in BCS between breeds
System 1-2: < 0.5 t DM/cow imported feed
System 3: 0.5 to 1.0 t DM/cow imported feed
System 4-5: >1.0 to 3.0 t DM/cow imported feed

Source: DairyNZ Economics Group
Other initiatives

• Stronger links with universities, training institutes
• High quality and deeper phenotypic data - fertility BV enhancement, robotic and fixed in line herd testing, environmental traits
• Residual feed intake (RFI)
• Addressing genomic pre-selection
Conclusions

• Build on our strengths
• DIGAD and animal evaluation at NZAEL
• Addressing data quality and exploring new data sources
• System divergence
• Potential new traits for Breeding Worth – BCS, RFI