Partitioning International Genetic Trends by Origin in Holstein bulls

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Introduction

• Globalized Holstein breeding
  – domestic selection
  – import of foreign animals/semen/...
    • upgrading population
    • supplementing national selection
    • exclusive reliance on import

• Strategic use of limited resources?!

• AIM: Assessment of country contributions to total merit index trends on global (world-wide) and local (national) scale
Partition EBV by the country of origin

\[ a_E = \frac{1}{2} a_C + \frac{1}{2} a_D + w_E \]
\[ a_E = \frac{1}{4} w_A + \frac{1}{4} w_B + \frac{1}{2} w_C + \frac{1}{2} w_D + w_E \]
\[ a_E = a_{E,X} + a_{E,Y} \]
Material

- Interbull Holstein MACE results
  - USA, GBR, IRL, and NZL scale
  - 37 traits
  - Total merit index (USA, GBR, IRL, and NZL) (145,611 bulls, protein as „reference“)

- Number of daughters per bull (1980-2003)
  - USA: 21,261
  - GBR: 6,529
  - IRL: 1,537
  - NZL: 4,849
Analysis workflow

Partition

Global

Weight by #daughters in a country

Local

Summarize

Summarize
Global USA TMI (NM)

- Sum
- CAN
- DEU
- FRA
- NLD
- USA

Total merit index vs. Birth year

- USA flag
- Canada flag
- Germany flag
- France flag
- Netherlands flag
Local USA TMI (NM)
Local GBR TMI (PLI)
Local IRL TMI (EBI)
Local NZL TMI (BW)
Conclusions

• Major influence of USA on global scale (in „decline“)

• GBR – faster improvement locally in comparison to the global trend

• NZL & IRL – different trait emphasis!
  – NZL capitalized on their domestic infrastructure
  – IRL lost opportunity, fast recovery on the way
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