Reliability of breeding values for DMI by adding data from additional research farms

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Introduction

- Feed
  - Milk production
  - Maintenance
  - Growth

- Main part of variable costs

- Breed for efficient cows
  - Reduce costs
  - Reduce greenhouse gases

Aim

To evaluate the **reliability** of **gEBV for DMI** after combining data from research farms and feeding companies

DMI data

- Data from 1990 onwards:

  - Research farms
    - WLR (historic)
    - ILVO

  - Feeding companies
    - Trouw Nutrition (historic)
    - Schothorst Feed Research (historic)
    - AVEVE

DMI data

- Data criteria:
    - ≥ 5 weekly DMI records per cow per parity

    - ≥ 5 animals per experimental treatment

    - Standardise DMI (excl. experimental treatments)

    - Lactation 1, 2 and 3

DMI data in June 2018

About: 160,000 records

5,400 cows

1,102 experimental treatments

8,400 lactations

Genotypes : ~2,300 cows

Multivariate model

- Corrections for different effects using a multivariate model:

dmi1 dmi2 dmi3 = breed + dim + agec +

$\qquad$ exp + herdmonth + herdyear +

$\qquad$ perm + animal + e

- H^{-1} matrix

Predictor traits

- Genomic EBV DMI directly from DMI genetic evaluation combined with national EBV for four predictor traits:
  - Kg milk
  - Kg fat
  - Kg prot
  - Liveweight

Genetic correlations

	DMI1	DMI2	DMI3
Kg milk	0.55	0.58	0.56
Kg fat	0.58	0.60	0.58
Kg prot	0.59	0.61	0.59
LiveWeight	0.67	0.45	0.41

- Selection index weighted based on reliabilities

- Model reliability

WAGENINGEN
UNIVERSITY & RESEARCH

100years
1918 — 2018

CRV

Reliabilities DMI – only genomics

| **2015**	**2016**	**2017**	**2018**
55,437 rec	+ 22,391 rec	+ 51,610 rec	+ 30,510 rec
2,249 anim	+ 965 anim	+ 1,149 anim	+ 1,082 anim
123 exp	+ 429 exp	+ 368 exp	+ 182 exp
2,922 lact	+ 1,502 lact	+ 2,529 lact	+ 1,409 lact
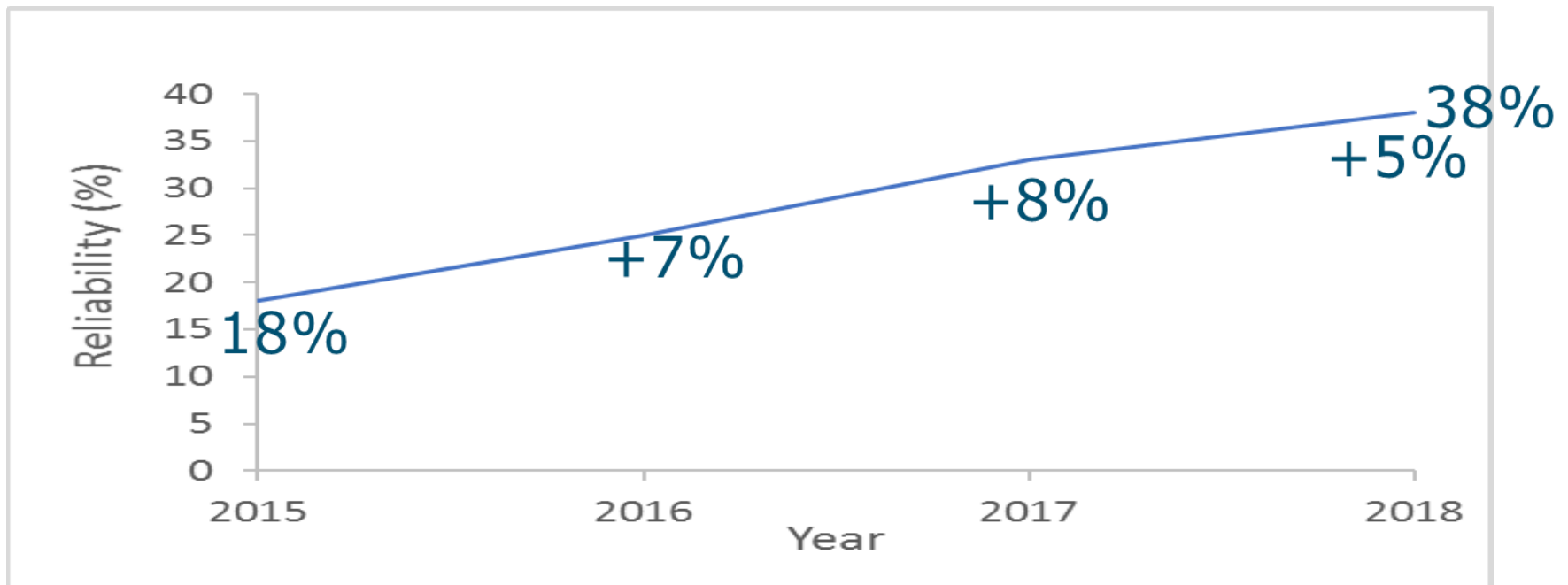
Reliabilities for bulls without daughters with DMI in pedigree of genetic evaluation DMI
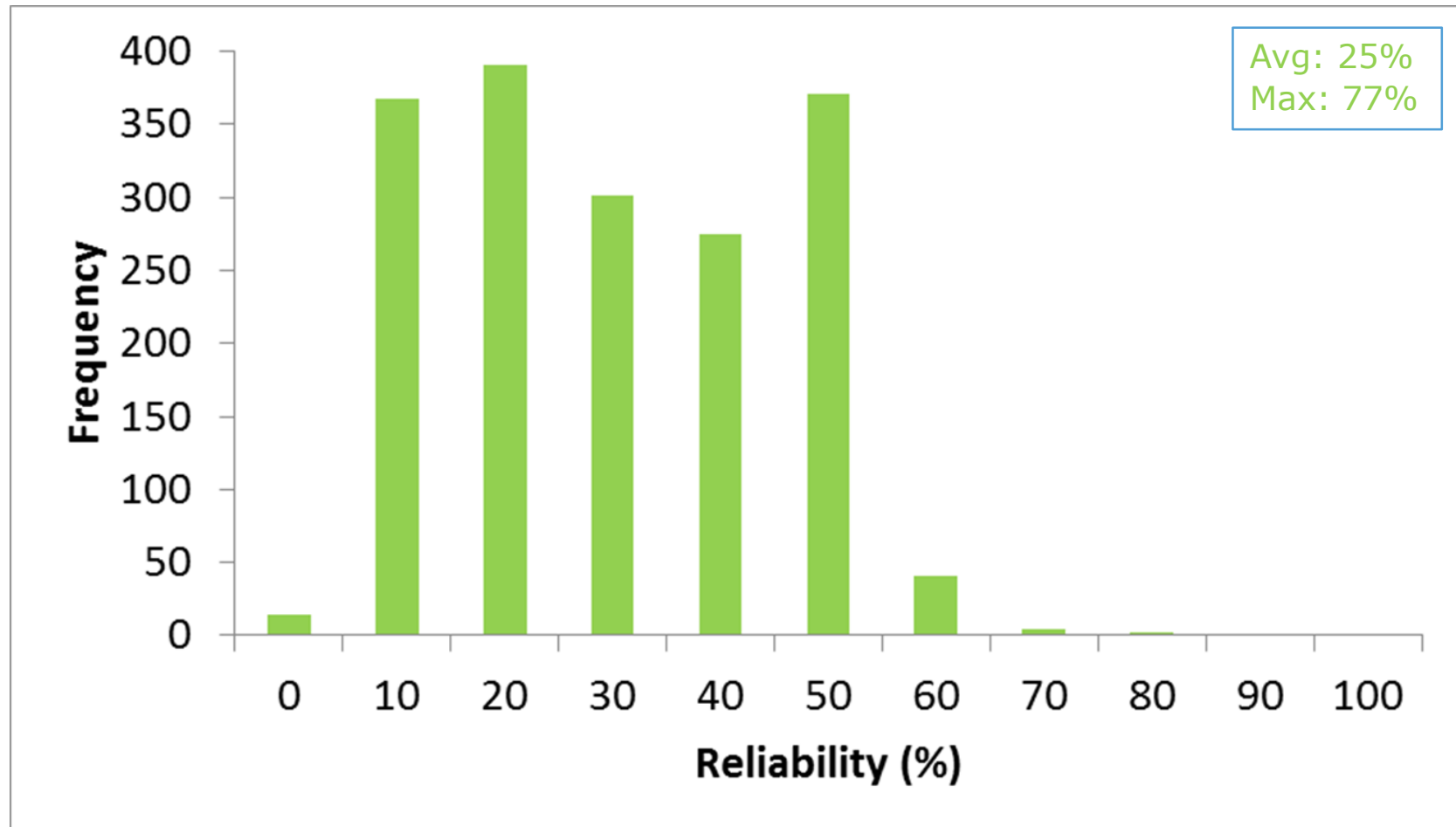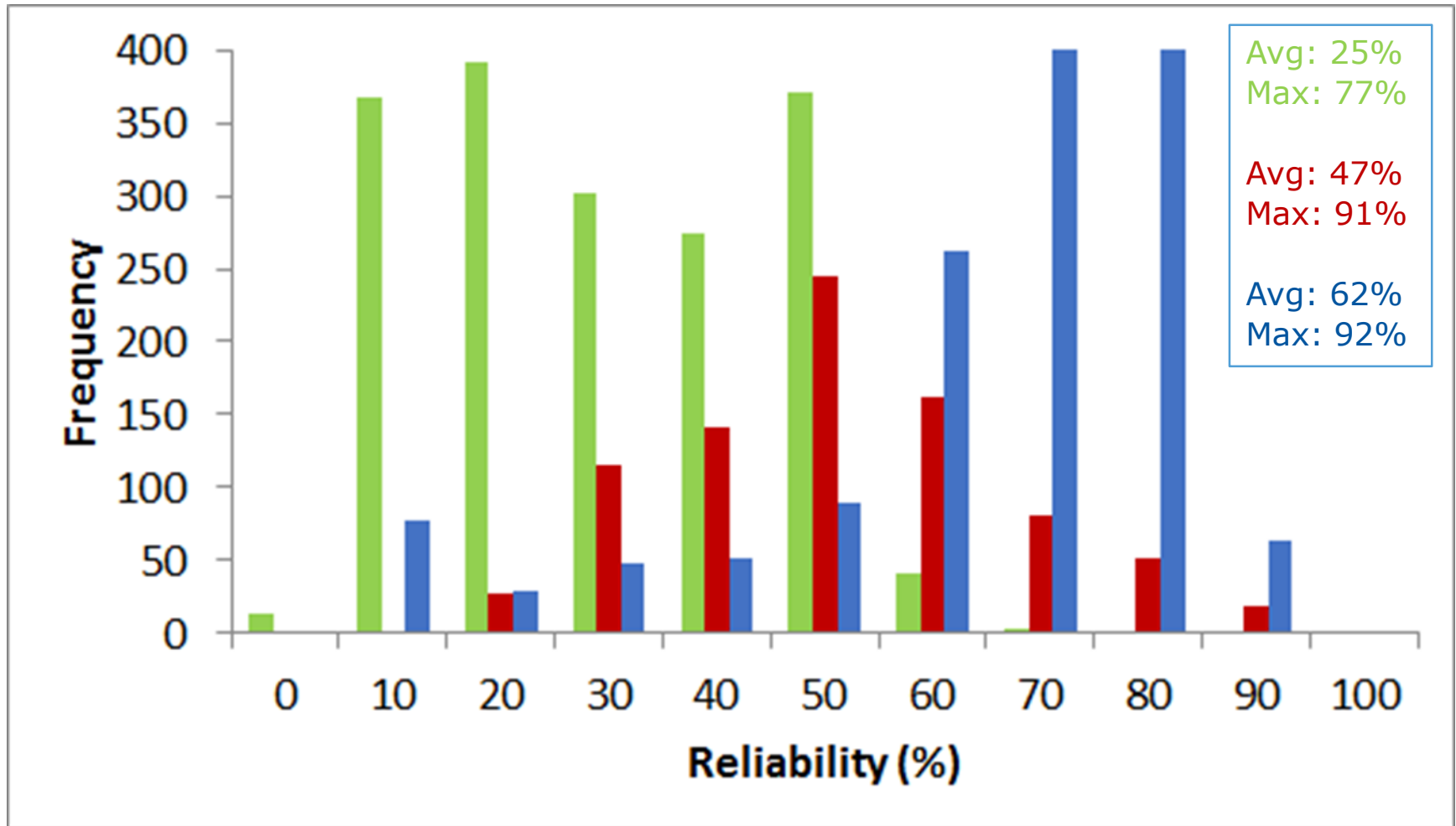
Reliabilities for bulls without (green) and with (red) daughters with DMI in pedigree of genetic evaluation DMI

Avg: 25%
Max: 77%

Avg: 47%
Max: 91%
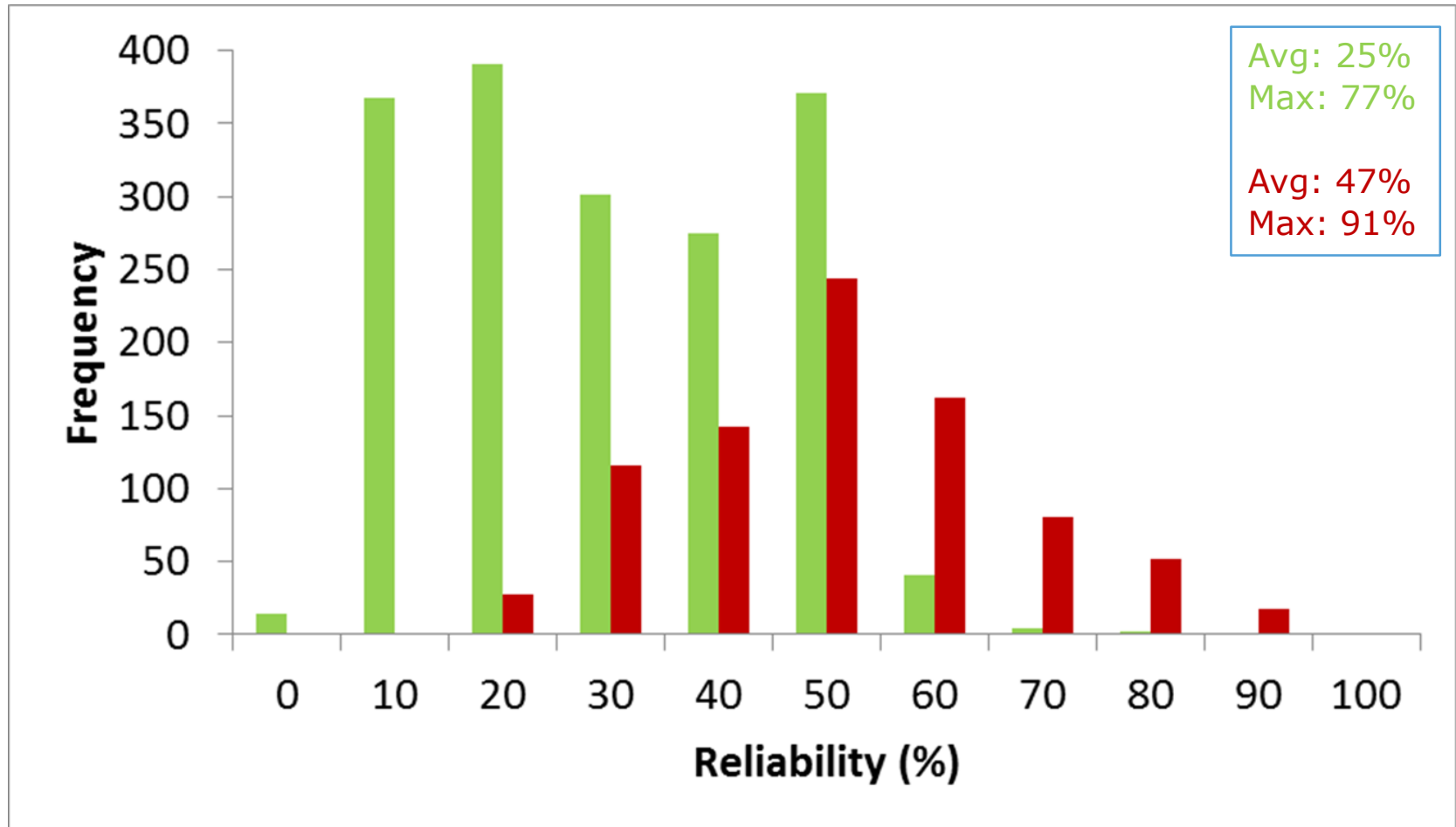
Reliabilities for all bulls in pedigree of genetic evaluation DMI + predictors (blue)

Avg: 25%
Max: 77%

Avg: 47%
Max: 91%

Avg: 62%
Max: 92%

Conclusions

- June 2018:
  - ~ **25**% more DMI data compared to 2017
  - Reliability on average increased to **62**%

- December 2018:
  - DMI data will increase with another:
    - Expected to increase reliability to 70%
    - 1-2% records and experimentations
    - **8-9**% animals and lactations.
  - Official genetic evaluation with more bulls with information through predictors

Acknowledgements

Reliability breeding value for DMI

- On average 62% in June 2018

- Expected to increase to 70% in December 2018!