Interbull Business Meeting

Reinhard Reents

Interbull SC Chair (2006-2019)

Interbull SC (1999—2019)

Interbull Collaborator (1993 – 20??)

Four decades of Interbull

~ 1980 - 1992

- Mixed model methodology (BLUP)
  - Comparison of (BLUP) methods
- Use of frozen semen

Standardisation / Harmonisation

Conversion

~ 1993 - 2001

- Comparison of bulls additive genetic values
  - Use of links between populations
- Data collection for additional traits

Infrastructure,
Interbull centre
MACE

~ 2002 - 2010

- More traits / populations / breeds evaluated

Expansion

- Traits, Countries

~ 2011 – 2023

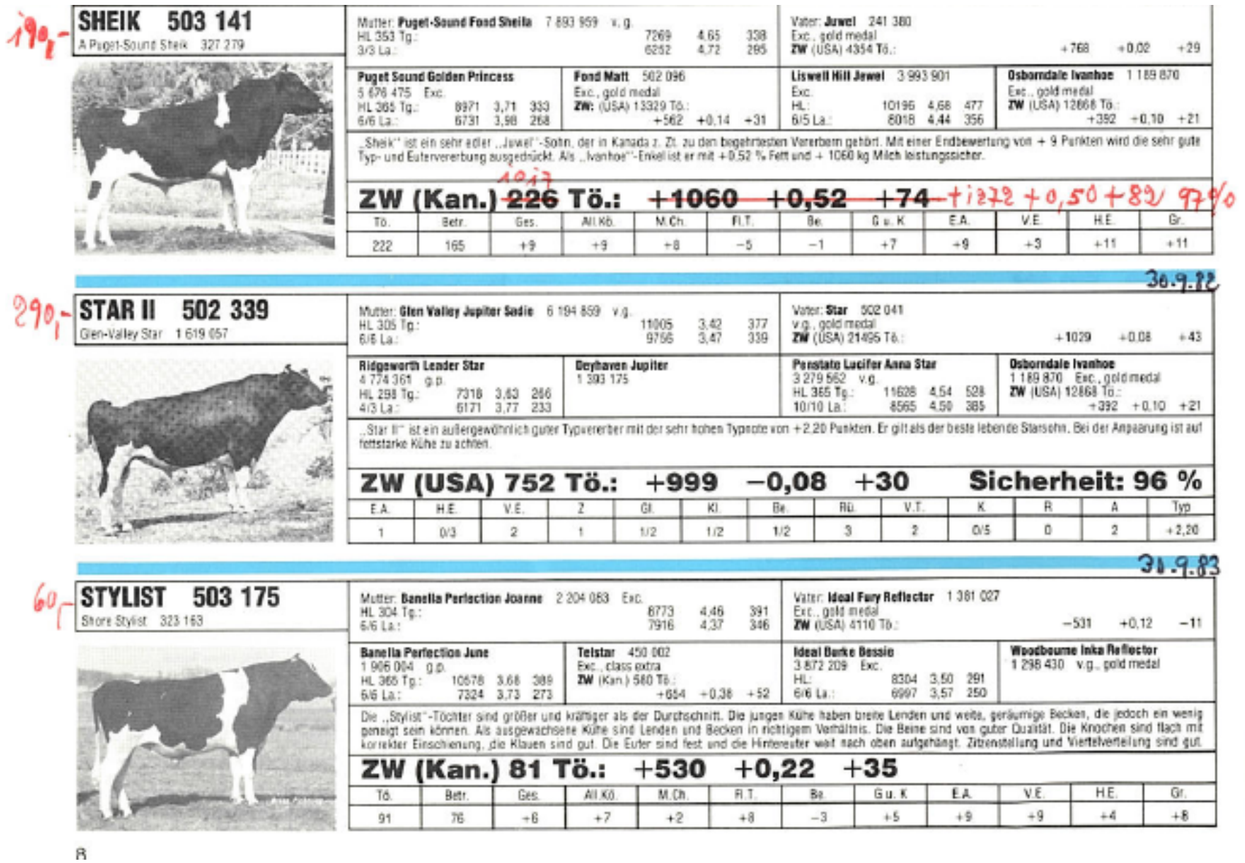
- Implementation of Genomic Selection
- New Services

Expansion

- GEBV validation, Intergenomics, data sharing

Reality in the 70/80ties

- High prices for semen
- Not at all comparable between different sources
- Disappoinment from individual bulls progeny



SHEIK 503 141
A Puget-Sound Sheik 327 279

Mutter: **Puget-Sound Fond Sheila** 7 893 959 v. g.
HL 353 Tg.: 7269 4,65 338
3/3 La.: 6252 4,72 295

Vater: **Juwel** 241 380
Exc., gold medal
ZW (USA) 4354 Tö.: +768 +0,02 +29

Puget Sound Golden Princess 5 676 475 Exc.
HL 365 Tg.: 8971 3,71 333
6/6 La.: 6731 3,98 268

Fond Matt 502 096
Exc., gold medal
ZW: (USA) 13329 Tö.: +562 +0,14 +31

Liswell Hill Jewel 3 993 901
Exc.
HL: 10196 4,68 477
6/5 La.: 8018 4,44 356

Osborndale Ivanhoe 1 189 870
Exc., gold medal
ZW (USA) 12868 Tö.: +392 +0,10 +21

„Sheik" ist ein sehr edler „Juwel"-Sohn, der in Kanada z. Zt. zu den begehrtesten Vererbern gehört. Mit einer Endbewertung von + 9 Punkten wird die sehr gute Typ- und Euervererbung ausgedrückt. Als „Ivanhoe"-Enkel ist er mit +0,52 % Fett und + 1060 kg Milch leistungssicher.

ZW (Kan.) 226 Tö.: +1060 +0,52 +74

Tö.	Betr.	Ges.	Ail.Kö.	M.Ch.	Fl.T.	Be.	G.u.K.	E.A.	V.E.	H.E.	Gr.
222	165	+9	+9	+8	−5	−1	+7	+9	+3	+11	+11

STAR II 502 339
Glen-Valley Star 1 619 057

Mutter: **Glen Valley Jupiter Sadie** 6 194 859 v.g.
HL 305 Tg.: 11905 3,42 377
6/6 La.: 9766 3,47 339

Vater: **Star** 502 041
v.g., gold medal
ZW (USA) 21495 Tö.: +1029 +0,08 +43

Ridgeworth Leader Star 4 774 361 g.p.
HL 298 Tg.: 7316 3,83 266
4/3 La.: 6171 3,77 233

Deyhaven Jupiter 1 393 175

Penstate Lucifer Anna Star 3 279 562 v.g.
HL 365 Tg.: 11628 4,54 528
10/10 La.: 8565 4,50 385

Osborndale Ivanhoe 1 189 870 Exc., gold medal
ZW (USA) 12868 Tö.: +392 +0,10 +21

„Star II" ist ein außergewöhnlich guter Typvererber mit der sehr hohen Typnote von +2,20 Punkten. Er gilt als der beste lebende Starsohn. Bei der Anpaarung ist auf fettstarke Kühe zu achten.

ZW (USA) 752 Tö.: +999 −0,08 +30 Sicherheit: 96 %

E.A.	H.E.	V.E.	Z	Gl.	Kl.	Be.	Rü.	V.T.	K.	R.	A.	Typ
1	0/3	2	1	1/2	1/2	1/2	3	2	0/5	0	2	+2,20

STYLIST 503 175
Shore Stylist 323 163

Mutter: **Banella Perfection Joanne** 2 204 083 Exc.
HL 304 Tg.: 8773 4,46 391
6/6 La.: 7916 4,37 346

Vater: **Ideal Fury Reflector** 1 381 027
Exc., gold medal
ZW (USA) 4110 Tö.: −531 +0,12 −11

Banella Perfection June 1 906 004 g.p.
HL 365 Tg.: 10678 3,68 389
6/6 La.: 7324 3,73 273

Telstar 450 002
Exc., class extra
ZW (Kan.) 560 Tö.: +654 +0,38 +52

Ideal Burke Bessie 3 872 209 Exc.
HL: 8304 3,50 291
6/6 La.: 6997 3,57 250

Woodbourne Inka Reflector 1 298 430 v.g., gold medal

Die „Stylist"-Töchter sind größer und kräftiger als der Durchschnitt. Die jungen Kühe haben breite Lenden und weite, geräumige Becken, die jedoch ein wenig geneigt sein können. Als ausgewachsene Kühe sind Lenden und Becken in richtigem Verhältnis. Die Beine sind von guter Qualität. Die Knochen sind flach mit korrekter Einschienung, die Klauen sind gut. Die Euter sind fest und die Hintereuter weit nach oben aufgehängt. Zitzenstellung und Viertelverteilung sind gut.

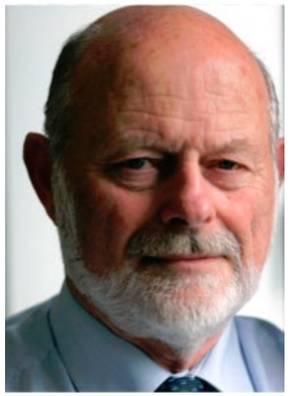
ZW (Kan.) 81 Tö.: +530 +0,22 +35

Tö.	Betr.	Ges.	Ail.Kö.	M.Ch.	Fl.T.	Be.	G.u.K.	E.A.	V.E.	H.E.	Gr.
91	76	+6	+7	+2	+8	−3	+5	+9	+9	+4	+8

Interbull concept to meet these challenges

Initiatives by IDF (Gravert) and EAAP (Cunningham) in the mid 1970-ies to form working groups addressing issues related to increased international trade of semen, suggesting

- to improve methods for estimation of BVs
- to harmonize methods of presenting EBVs
- methods for comparison of bulls across countries



ands

PURPOSE

RISTENSEN[4],

[3] *Institute of*
[4] *National In*
[5] *Rechenzen*
Republic o
[6] *Milk Marke*
[7] *Institut Na*
Jouy-en-Jo
[8] *Institute of*
(Sweden)

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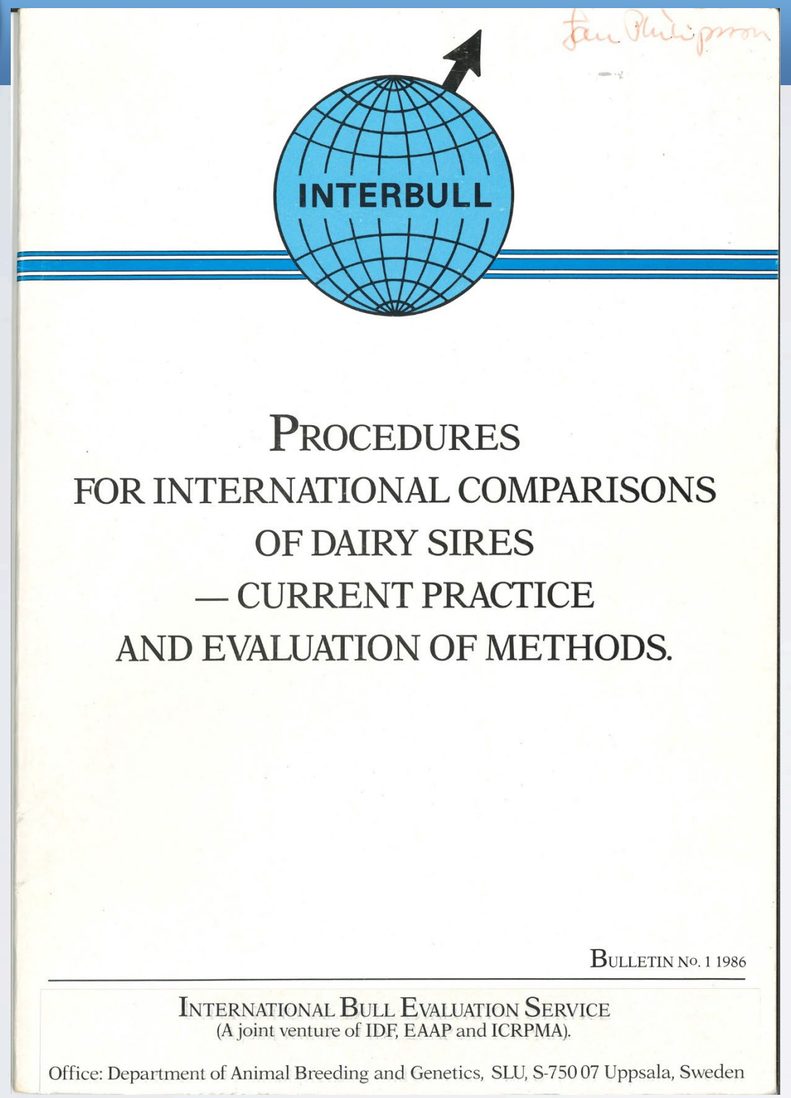

Report of an INTERBULL[1] working group

PROCEDURES FOR INTERNATIONAL COMPARISONS OF DAIRY SIRES - CURRENT PRACTICE AND EVALUATION OF METHODS

J. Philipsson[2] (coordinator), B. Danell[2], L.R. Schaeffer[3], M. Schneeberger[4], H. Schulte-Coerne[5] and J.B.M. Wilmink[6]

[1] INTERBULL is a joint venture of EAAP, IDF and ICRPMA under the chairmanship of Prof. Dr. N. Kuenzi, Zurich (until 1985 Prof. Dr. H.O. Gravert, Kiel) with the main objective to facilitate international sire comparisons

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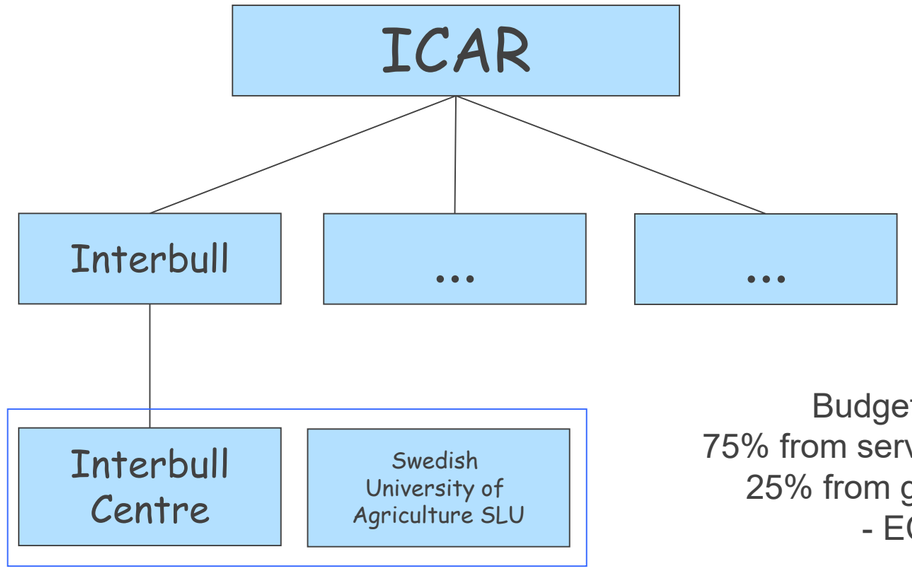
[3] Department of Animal and Poultry Science, University of Guelph, Guelph, Ontario, Canada N1G 2W1
[4] Herd Book Office for Swiss Braunvieh, Chamerstr. 56, 6300 Zug, Switzerland
[5] Federal Dairy Research Centre, P.O. Box 1649, 2300 Kiel, Federal Republic of Germany
[6] Royal Dutch Cattle Syndicate, P.O. Box 454, 6800 AL Arnhem, The Netherlands

Interbull Milestones 1nd decade

- 1983 Interbull Committee founded by IDF (Gravert), EAAP (Cunningham) and ICRPMA (Roos), and supported by FAO after a meeting at WCGALP in Madrid 1982
- 1988 Interbull permanent subcommittee of ICAR with its own Steering Committee



Budget:
75% from service fees
25% from grants
- EC, SLU
- ...

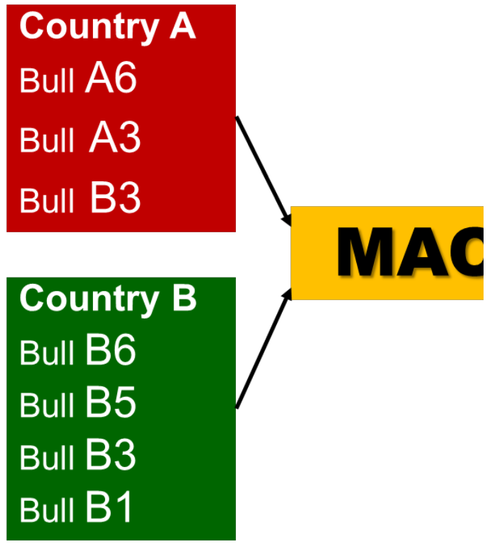
Interbull Milestones 2nd decade

- 1983 Interbull Committee founded by IDF (Gravert), EAAP (Cunningham) and ICRPMA (Roos), and supported by FAO after a meeting at WCGALP in Madrid 1982
- 1988 Interbull permanent subcommittee of ICAR with its own Steering Committee
- 1990/91 Interbull Centre established at SLU, Uppsala, financed by Swedish organizations – R&D capacity
- 1992/93 Start with MACE work (Schaeffer, Banos, Sigurdsen, …)
- 1993 Aarhus – decision to conduct IGEs
- 1995 1:st fully user-paid international routine evaluation
- 1996 Appointed as EU-laboratory for bovine genetics
  - $r^2_{EBVmilk}$ > 0.5 as a result of the disappointment from early importations

MACE – Multiple Across Country Evaluations

SERVICE

- Method for inter
  evaluations to c
  measures of ge
  traits



SYMPOSIUM: USE OF INTERNATIONAL DATA IN NATIONAL GENETIC EVALUATIONS

Factors Influencing International Comparisons of Dairy Sires

L. R. SCHAEFFER, R. REENTS, and J. JAMROZIK
Centre for Genetic Improvement of Livestock,
Department of Animal and Poultry Science,
University of Guelph, Guelph, ON, Canada N1G 2W1

ABSTRACT

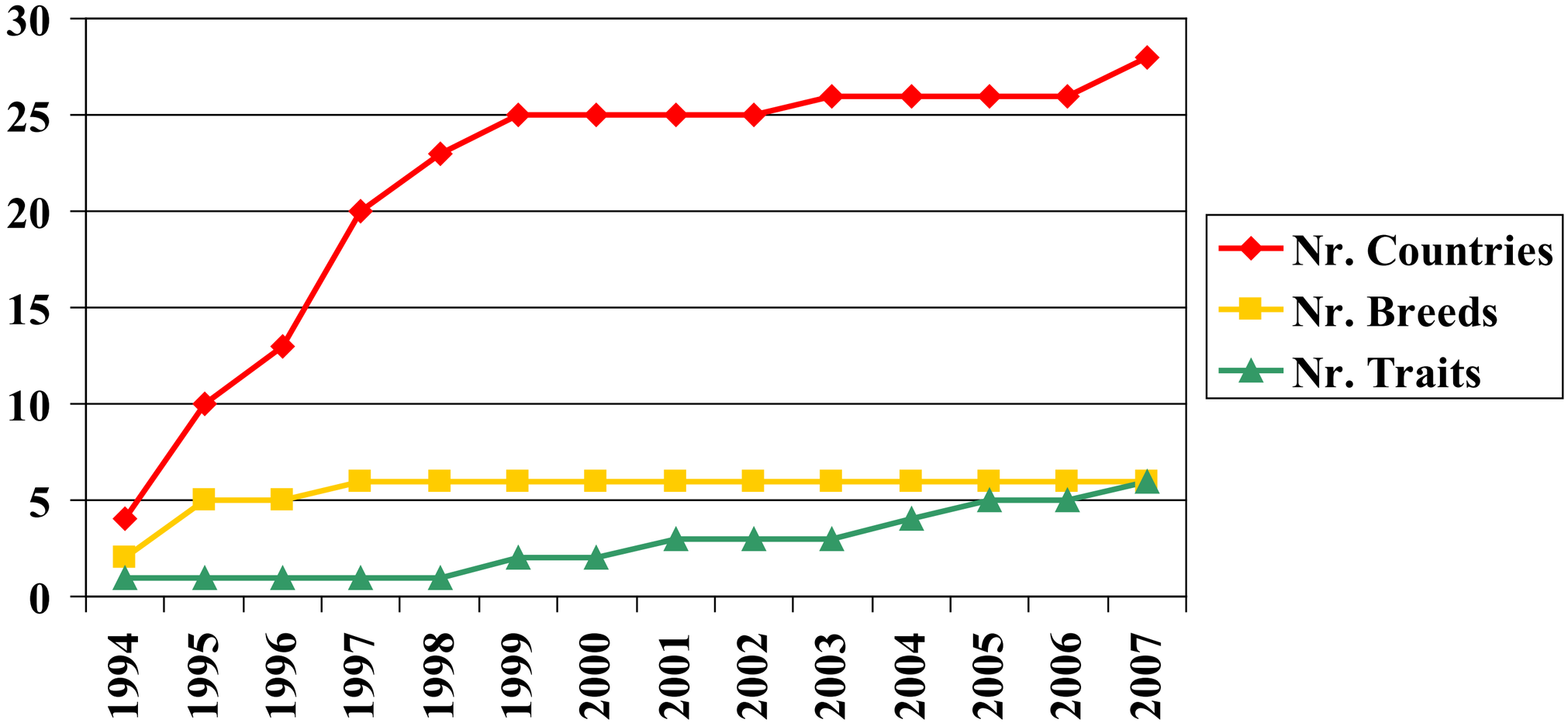
A method of dairy sire evaluation across multiple countries is described. Factors influencing this method are overestimation of genetic trends within countries, inclusion of evaluations of imported bulls, years of birth of the bulls included in the analysis, and estimates of genetic correlations between countries. Fall 1994 evaluations for milk, fat, and protein yields from Canada (4559 bulls), Germany (5894 bulls), and France (8419 bulls) were used to study

INTRODUCTION

International comparisons of dairy sires have progressed from the application of simple regression procedures to **MACE** (multiple-trait evaluations across countries) (7) in which deregressed bull evaluations from several countries are analyzed simultaneously in a multitrait model incorporating genetic correlations between countries that may be less than unity. North American dairy sires have many half-sib and full-sib sons that are progeny

Development of Interbull test I, II, III

Expansion 2nd decade



Development and implementation

- Structured procedure (of the early years)
  - Need for a service identified in business meetings
  - Interbull centre plus 1-2 national genetic evaluation centres did the development work
    - Research runs
  - Interbull Workshop dedicated to one trait group → possibilities to implement ??
    - Call for more data
  - Pilot / implementation run at ITC
  - Routine run

Important to get National Genetic Evaluation centres involved

- With more geneticists at Interbull centre
  - Research and implementation runs at Interbull centre

EVALUATIONS

MACE – Multiple Across Country Evaluations

BREED GROUPS



Holstein
Jersey
Brown Swiss
Guernsey
Red Dairy Cattle, incl. Dairy Shorthorns
Simmental, incl. Montbeliarde



TRAIT GROUPS

Calving	
Conformation	
Female Fertility	
Longevity	
Production	
Udder health	
Workability	

Dairy Cattle Breeding ~ 2008

- Use of best international genetic material

  → Selected on Interbull MACE EBVS for all important traits

- Very good acceptance of progeny tested bulls by the farmers compared to the early days of importation of semen

BUT: a very costly system

3rd decade: Genomic selection

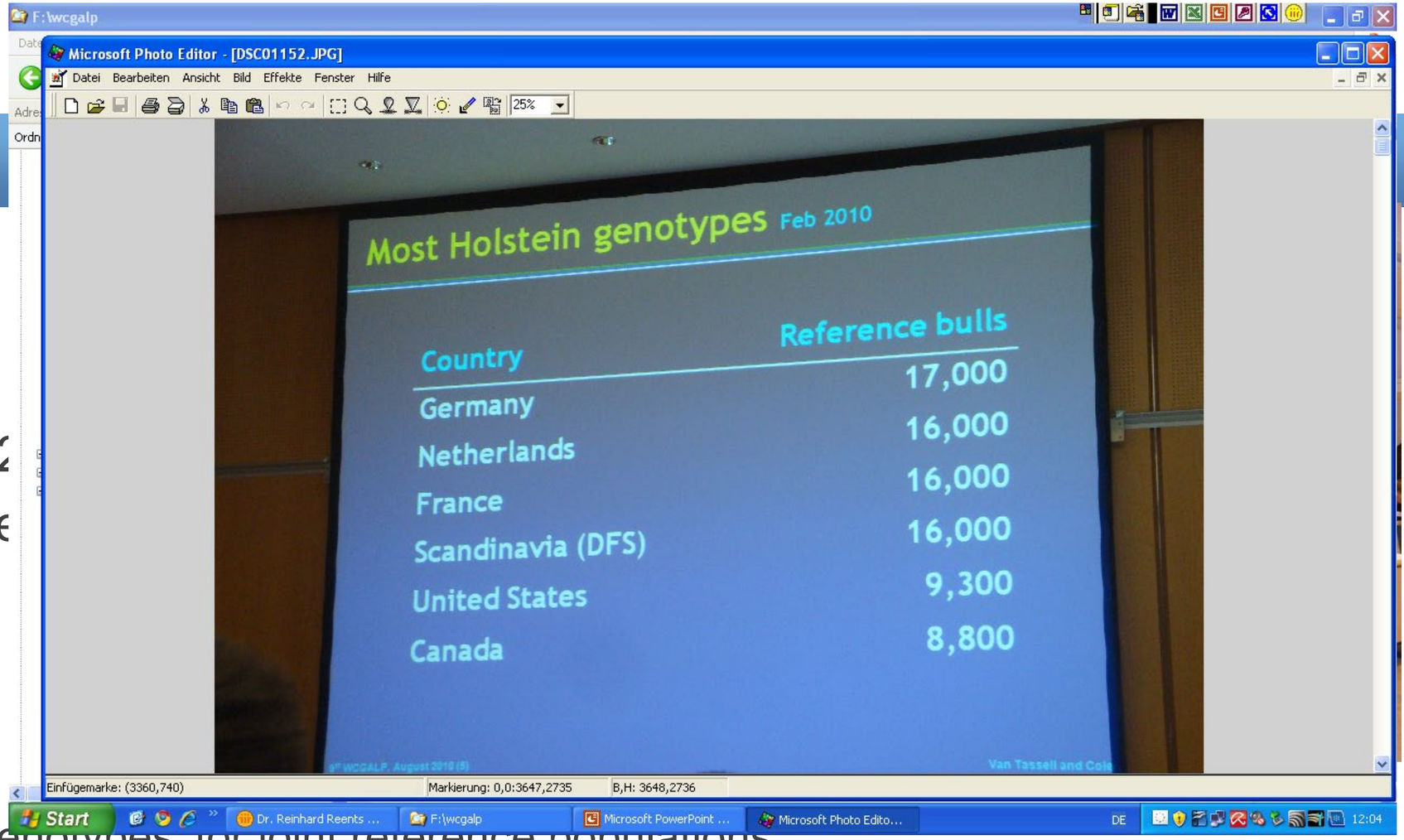
- Meuwissen, Hayes, Goddard 2001 use of SNP data

- Schaeffer (2006)
  - Double genetic gain (fulfilled)
  - Reduce costs (??)

- Interbull still relevant?
  - Derive predictive formula
  - Select bulls → market them with national figures
  - Get genotype from foreign bull
  - Get accurate Genomic Evaluation on national scale

Genom

- SAC report 2007
- 2008 Task Force
- Workshops from 2
- Numerous joint se
  - EAAP
  - ICAR
  - WCGALP



- MACE EBVs as 'phenotypes' for joint reference populations
  → enabled more efficient use of phenotypes in consortia

- Validation
  - As a service
  - As EU reference Centre for bovine genetics

VALIDATION

Conventional Validation

SERVICE

- Validation of national conventional breeding values
- Uses TrendTest software, available exclusively for Interbull users via the IDEA interface, allowing 3 different testing methods
- Prerequisite for using progeny tested bulls in Europe
  - $r^2 > 50\%$

BENEFITS

- Provides independent assessment and quality assurance of EBVs
- Assurance that statistical models applied are sound and appropriate to the data
- Confirmation that bias in statistical models applied for a given breed or trait are within a tolerated threshold of 2%

VALIDATION

GEBV-test

SERVICE

- Validation of national genomic breeding values that evaluates:
  - Unbiasedness - assessment of consistency of genetic trend captured by GEBV
  - Consistency of variation of GEBVs and EBVs
  - Improvement in accuracy from the use of GEBV instead of EBV

- Prerequisite for using genomically tested tested bulls in Europe

EVALUATIONS

Interbeef

SERVICE

- International evaluation for beef cattle
- Across-country multi-trait animal model based on raw performance data from males and females
- Relationship among animals provided via international pedigree
- Only for non-ET animals
- 3 evaluations per year

BENEFITS

- International EBVs expressed on a domestic scale, calculated based on performance information
- Breeders can access a larger international panel of bulls that better meet their selection objectives

Interbeef

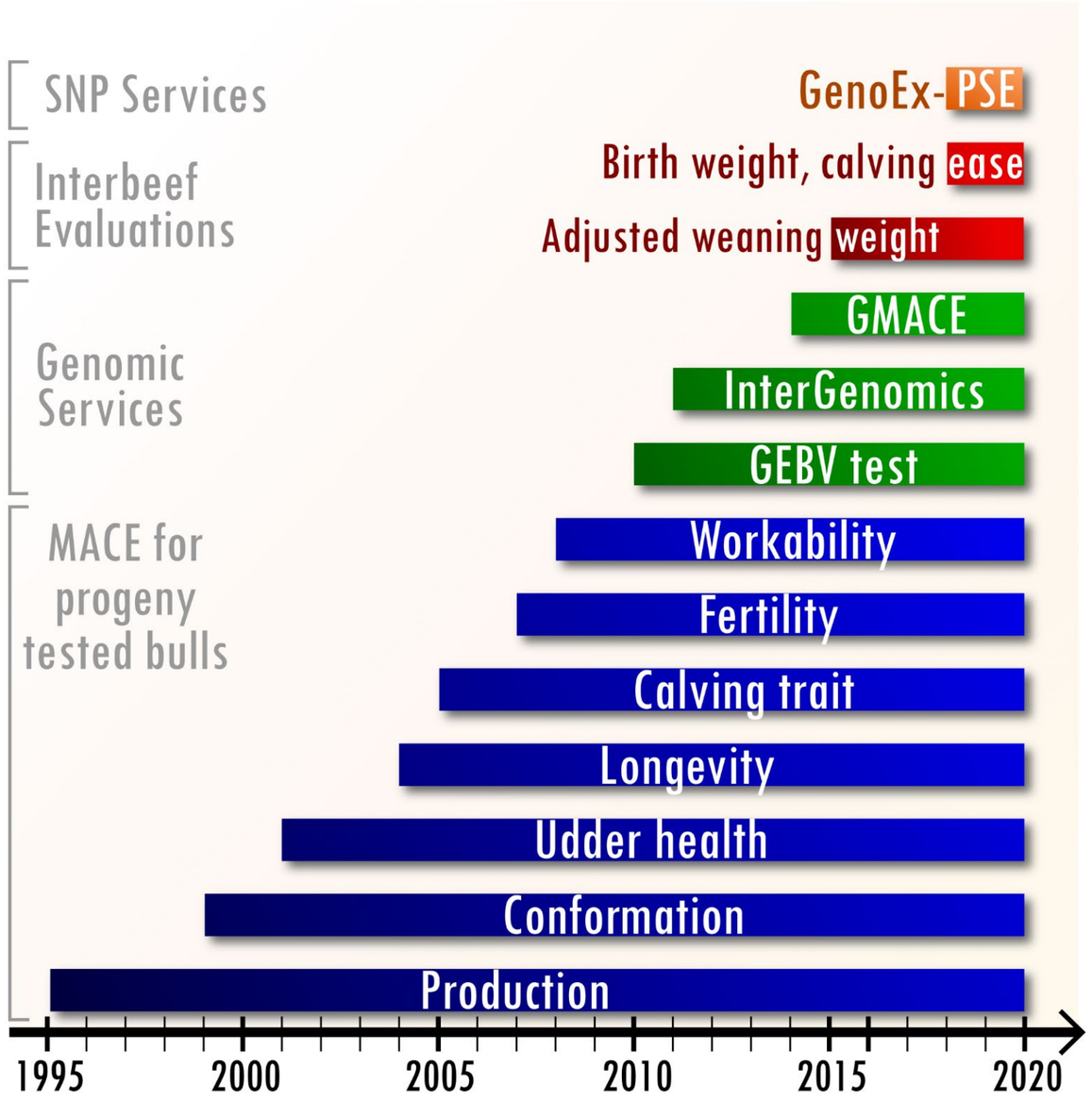
BREED GROUPS

TRAIT GROUPS

Adjusted Weaning Weight (adww)	**Calving traits (calv)**	**Carcass traits (carc)**
Animal Weaning Weight (aww)	Birth Weight (bwt) Calving Ease (cae) - direct and maternal effects	Carcass conformation (cco) Carcass fat (cfa) Carcass weight (cwe)

Portfolio

Development of Interbull portfolio



‘DNA’ of Interbull

1. Communication
   - Sharing of knowledge and experiences

2. Conduct R&D in house and with partners

3. Develop and deliver genetic evaluation services, incl. validation

4. Networking

Committ

Interbull Steering Committee

Networking

Role Interbull in the future

- Networking more needed than ever
  - Interbull is the perfect place where science and application / implementation meets
- Quality control / validation
- More phenotypes (also sensor data) are needed to utilize more genomic data
  - Long tradition of Interbull
  - Good access to standardized recording practices via ICAR
  - Focus on demands from the public
    - Climate
    - Animal health
    - …
- Challenge is to (re)act fast enough with industry changes

int vision

SC

n

- Dedicated Centre Directors + Centr
  - Banos, Emanuelson, Fikse, Dürr, Roz