

German Experiences with Implementation and Publication of GMACE

Dr. Helge Täubert & Dr. Stefan Rensing,
Vereinigte Informationssysteme Tierhaltung w.V. (**vit**), Verden

Historical Development

- National gEBV since 2010
 - GMACE since 2014
 - Germany was first country that published GMACE (since implementation run 1404)
 - Including all summarizing indices and total merit gRZG
 - In-between:
 - (national) gEBV base for all decisions in breeding programs
 - especially selection of sires of sons
 - national gEBV for potential foreign sires of sons on the base of first straws (or SNP exchange) → full comparability to national bulls (traits, scale, reliability)
- When GMACE came for majority of important foreign young bulls national gEBV were/are available
- And most important source of foreign HOL genetic was/is not in GMACE: USA/CAN



GMACE works

Presentation INTERBULL workshop in Berlin, May 2014:

- 847 foreign bulls with independent GMACE- and DEU-gEBV (no DEU info in GMACE)

	GMACE	gEBV DEU	Diff. GM-DEU	s Diff.
<i>rel. protein kg</i>	66.2	72.6	-6.3	
protein kg	40.6	41.3	-0.7	7.0
fat kg	40.4	42.7	-2.3	8.7
milk kg	1201	1154	48	229
prod. index (RZM)	119.7	120.5	-0.8	4.9
<i>rel. RZE</i>	61.7	55.8	5.9	
conf. index (RZE)	118.0	117.6	0.4	4.0
stature	109.0	109.8	-0.9	3.7
udder depth	114.2	116.0	-1.8	4.3

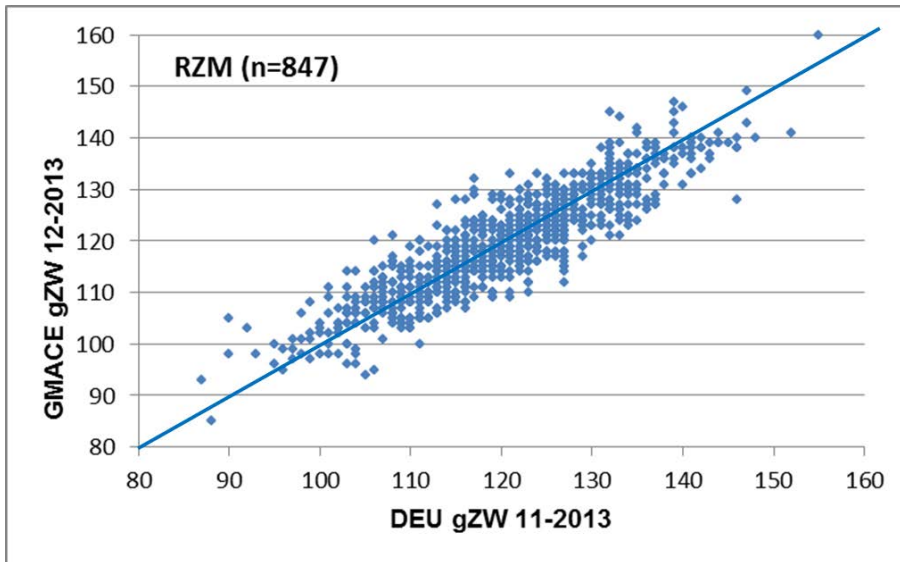
Except milk prod. traits
 All traits on relative scale
 $\emptyset = 100$
 $S = 12$

- Average GMACE-gEBV very similar to (independent) DEU-gEBV
- In tendency GMACE-gEBV are lower compared to DEU-gEBV
- Reliabilities different

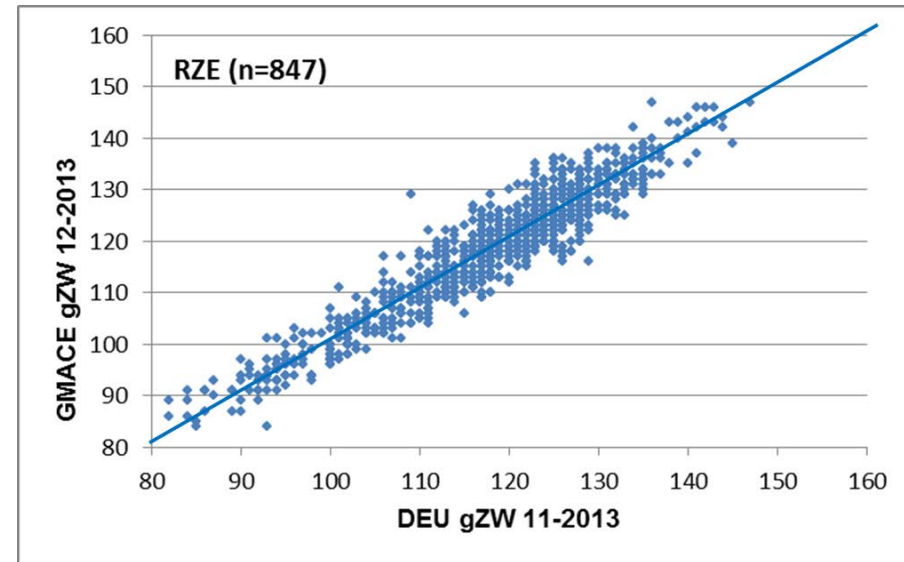


GMACE works

RZM = production index
Scale: $\bar{x}=100$, $s=12$



RZE = total conformation index
Scale: $\bar{x}=100$, $s=12$



- \bar{x} GMACE: 119.7 \bar{x} DEU: 120.5 Diff.: -0.8
- \bar{x} deviation: ± 4.9

- \bar{x} GMACE: 118.0 \bar{x} DEU: 117.6 Diff.: +0.4
- \bar{x} deviation: ± 4.0

➔ No systematic over- or under-estimation



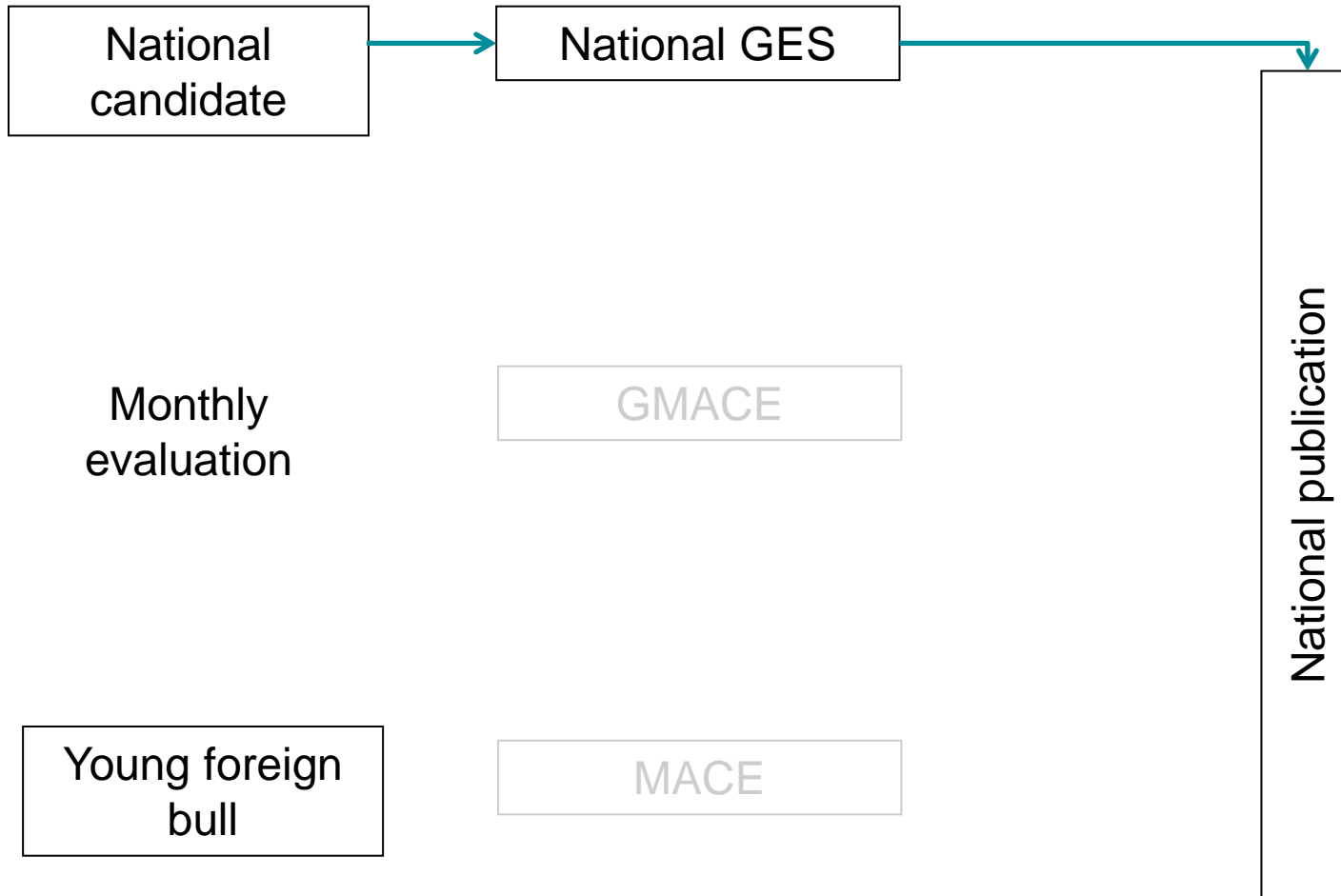
GMACE works, but ...

- Converts national gEBV to other country scales
 - With loss of reliability
 - With in principal same ranking as in country of origin
- ➔ same/more “limitations” as classical MACE
- ➔ but different to MACE there is an alternative available (national gEBV)

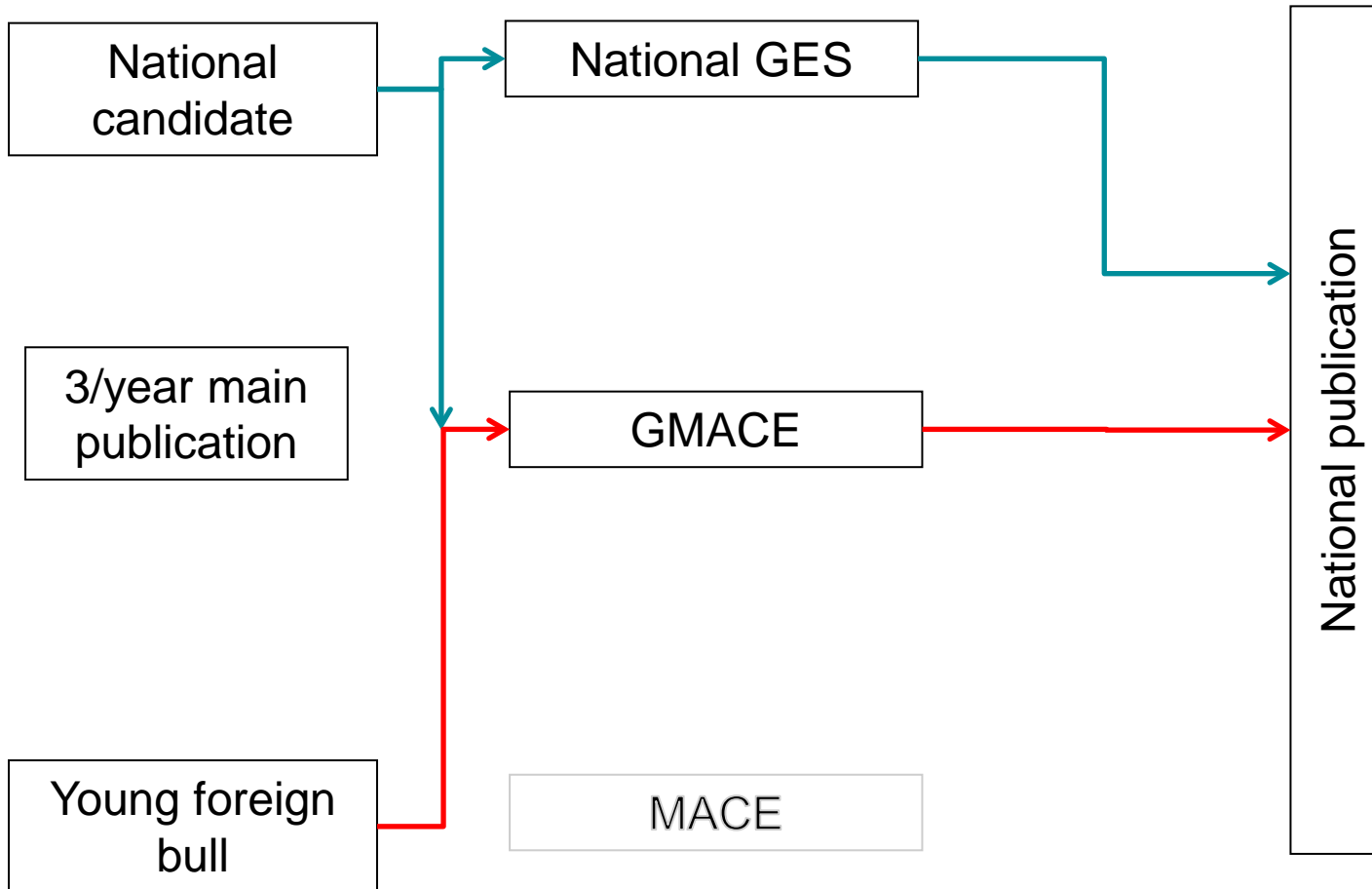
- Technical issues:
 - Unsolved comparability of reliability
 - Heterogeneity of “composition” of national gEBVs ➔ IB de-regression “sub-optimal”
 - Provided national gEBV for GMACE “older” than national gEBV at publication
 - Only 3 times/year GMACE (national GE monthly)
 - Missing bulls in publication lists because of problems with ownership/BCC
 - No more genomic information with first daughter proof (inconsistent ‘transition’)



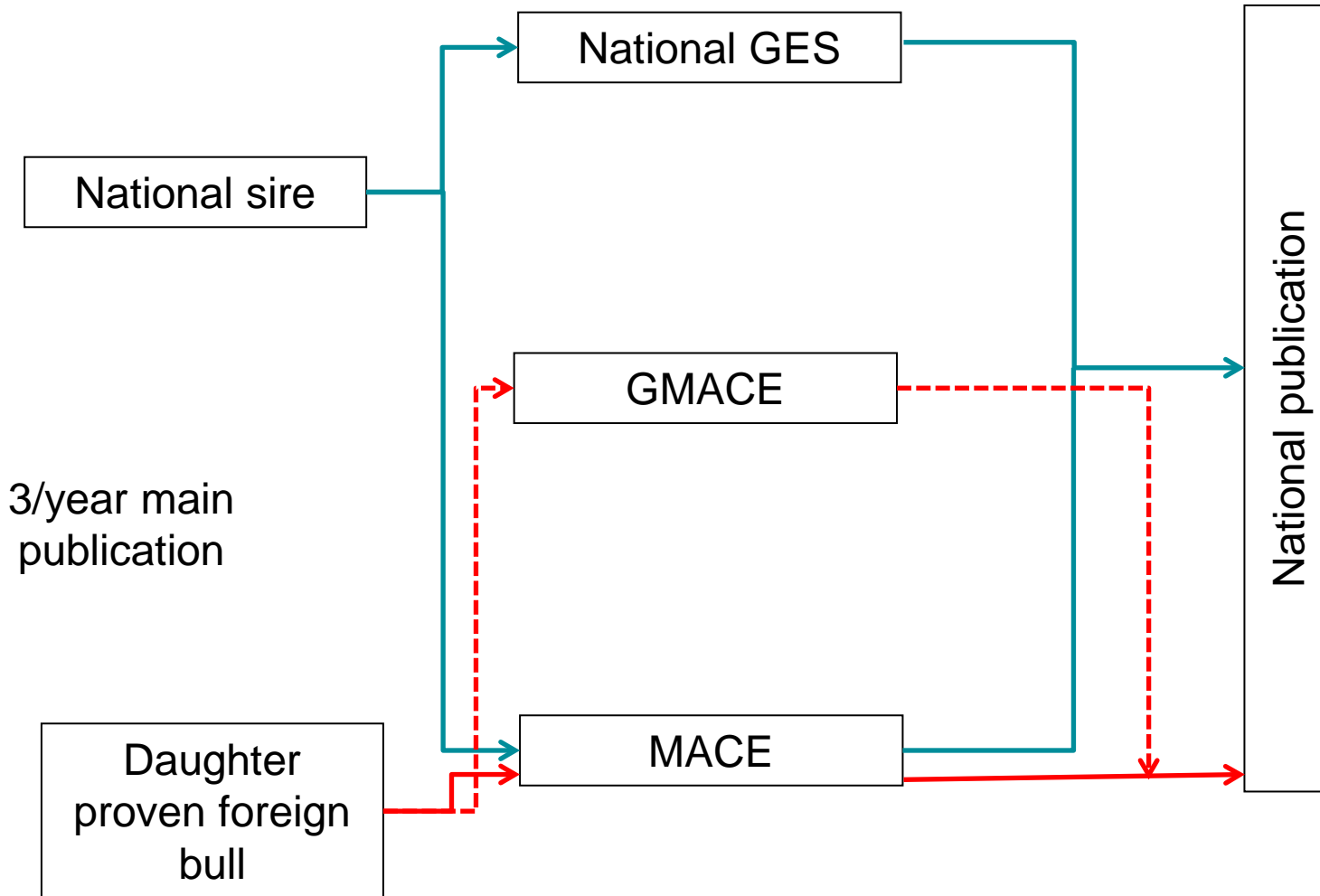
Technical implementation



Technical implementation



Technical implementation



GMACE publication (I)

■ DEU:

- Since 04-2014 (implementation run)
- With all summarizing indices and total merit index gRZG
- On the same webpage as national and MACE results (www.vit.de)
- In case national gEBV exist, these are published (source is given for every bull)

→DEU follows all publication rules from Interbull

■ Technical implementation is finished

- All computer programs and jobstreams were adapted
- Use in routine evaluation now
- Automatic optimal integration/combination of GMACE – MACE – gEBV – EBV
- For domestic and international proofs



GMACE publication (II)

■ Other countries:

- In principle all other 26 countries participating in HOL MACE should do the same but
 - Some countries do not publish GMACE results at all
 - Some countries publish not all figures/traits
 - Some countries do not publish summarizing indices and total merit index
 - Some countries publish on webpages not accessible via the national publication webpage (only found by link on Interbull webpage)
 - Some countries publish results/traits on several webpages (of different organizations)
 - ...

➔ Does majority of countries not see GMACE as useful results for breeders?
(Interbull the worldwide network providing genetic information services for improvement of livestock)



GMACE publication (III)

- *In principle all other 26 countries participating in HOL MACE should do the same*
- Interbull publication rules:
 - In the past (for MACE) we had/have relatively general/unspecific
 - But almost all countries acted similar → ‘complete’ publication like intended
 - Even general documentation of rules is limited
 - Since GMACE different
 - ... ‘implementation run’ ...
 - New explicit rule *‘countries have only to publish single traits’*
- Does Interbull want all countries to publish ‘complete’ results?
(from MACE and GMACE)
- Consequences of not publishing summarizing indices and total merit index
 - foreign bulls can not be compared/selected on GMACE results
 - could be the end (of relevance) of MACE/GMACE for individual bull selection
 - only MACE would be needed for reference populations



GMACE DEU-bulls on other scales

- Many questions from German exporters of semen on the international publication of GMACE results
 - They can not find (all) results/bulls in many countries
 - They don't understand figures
 - They do not know who is responsible for national publication of GMACE or do not get (sufficient) answers from national bodies responsible for IB publication

Additional Aspects

- In countries with national genomic systems (comparable to DEU situation) national gEBV for relevant foreign young bulls are already available

- Countries without genomic systems
 - Often no or incomplete publication
 - Reliability of GMACE gEBV low
 - Genomics in general are not promoted because no national g-bulls available
 - Potential clients for foreign bulls mostly select these on the base of information from country of origin (like daughter proven bulls, too)



Conclusion

- *GMACE in principle works*

but

- Impact of GMACE results in DEU is minor because
 - National gEBV are available for most foreign bulls
 - It came late (3x/year)
 - Includes not all bulls (BCC)
 - Has still technical problems (statistical and timing)
 - Is in general not promoted by many countries

- The restrictive policy of other countries in publication of GMACE results fosters tendency in Germany to be more restrictive in publication, too



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