

Genomic-free EBVs computed from Single-Step evaluations as proofs for MACE in France

R. Rostellato, E. Dugas, S. Mattalia, T. Tribout,
D. Boichard and I. Croué

- Single April 2022, official EBVs for dairy breeds are estimated with a Single-Step evaluation in France

In France, Single-Step is going live!

Iola Croué, Marine Barbat, Amandine Launay, Julie Promp, Manon Guillerm, Philippe Boulesteix, Stéphanie Minéry, Sébastien Fritz, Thierry Tribout, Didier Boichard.



Genomic
preselection biais

+

SSEBVs used for
selection

Single-Step derived proofs for MACE and GMACE

4 breeds: Brown Swiss, Simmental,
Montbéliarde, Holstein

Groups of traits:
Production, fertility, conformation,
longevity, cell score, mastitis, calving

90 traits total

Single-Step proofs for MACE and GMACE

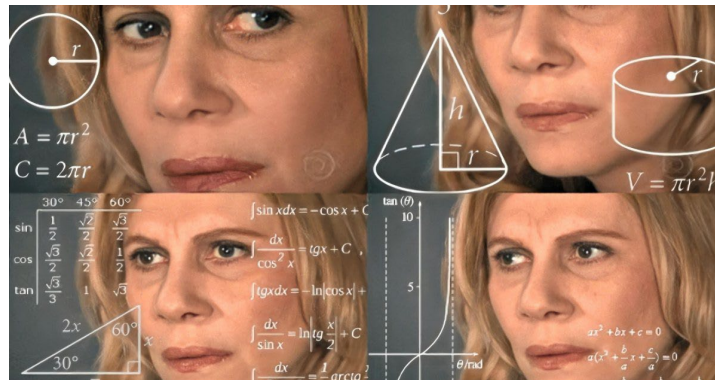
► GMACE: easy! Use of Single-Step EBVs



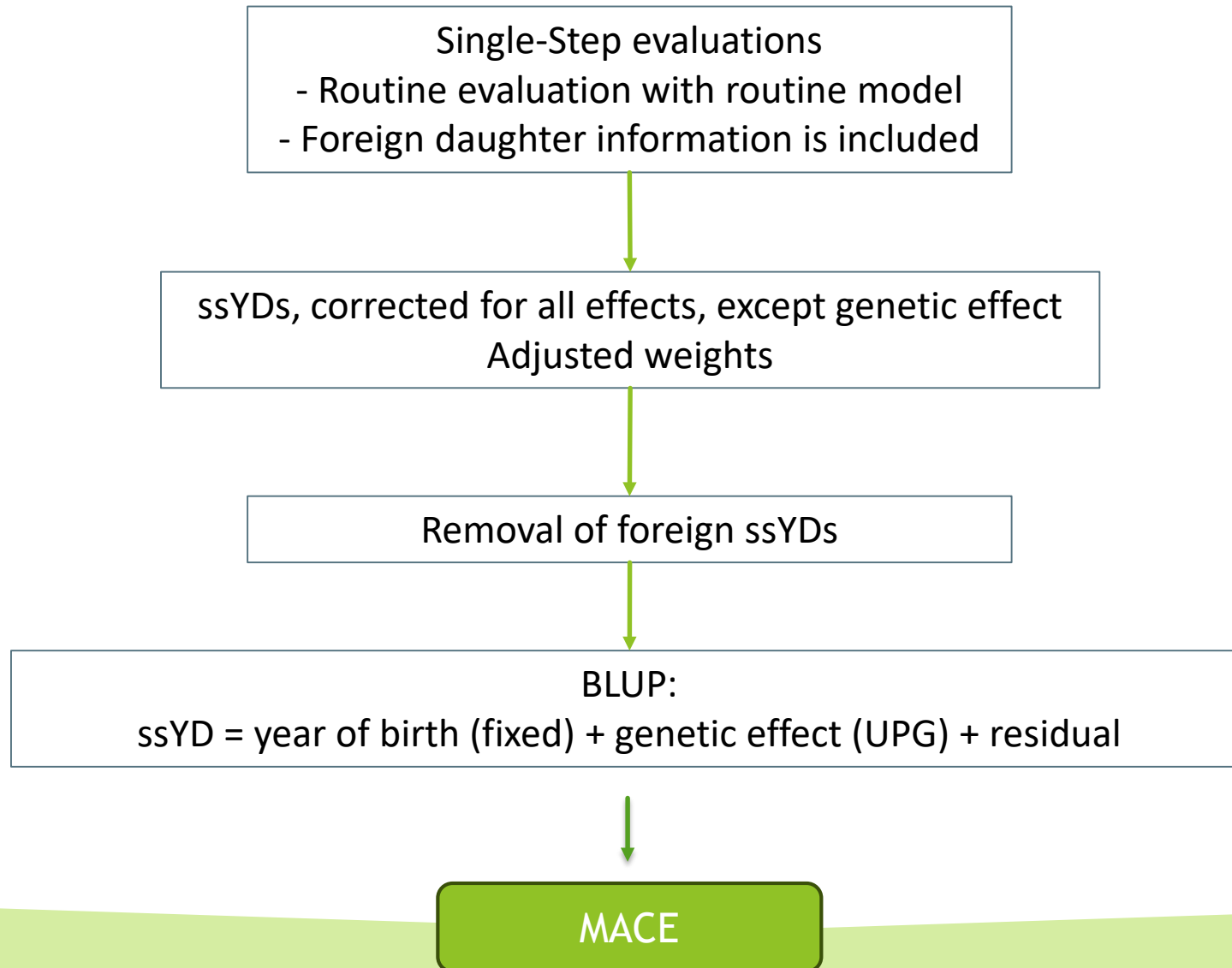
► MACE: ... Not so easy.

- Genomic-free proofs required; many options available
- Avoid double-counting of foreing information
- Limit the routine « Interbull-specific » worload and computing time

Thank you, Interbull
working group!

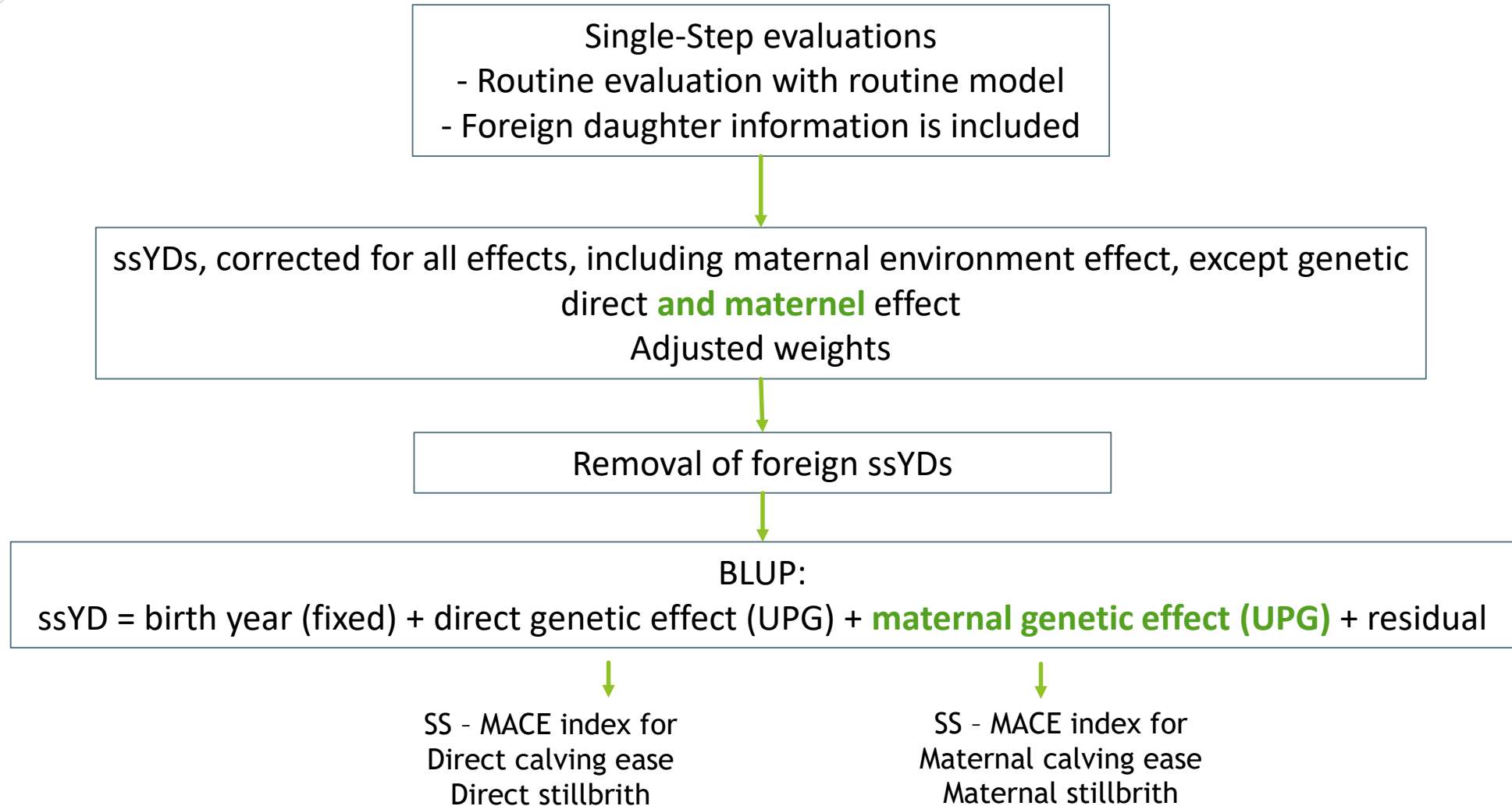


Model for all traits, except maternal traits



Looks very simple.
Wasn't that much.

Model for maternal traits



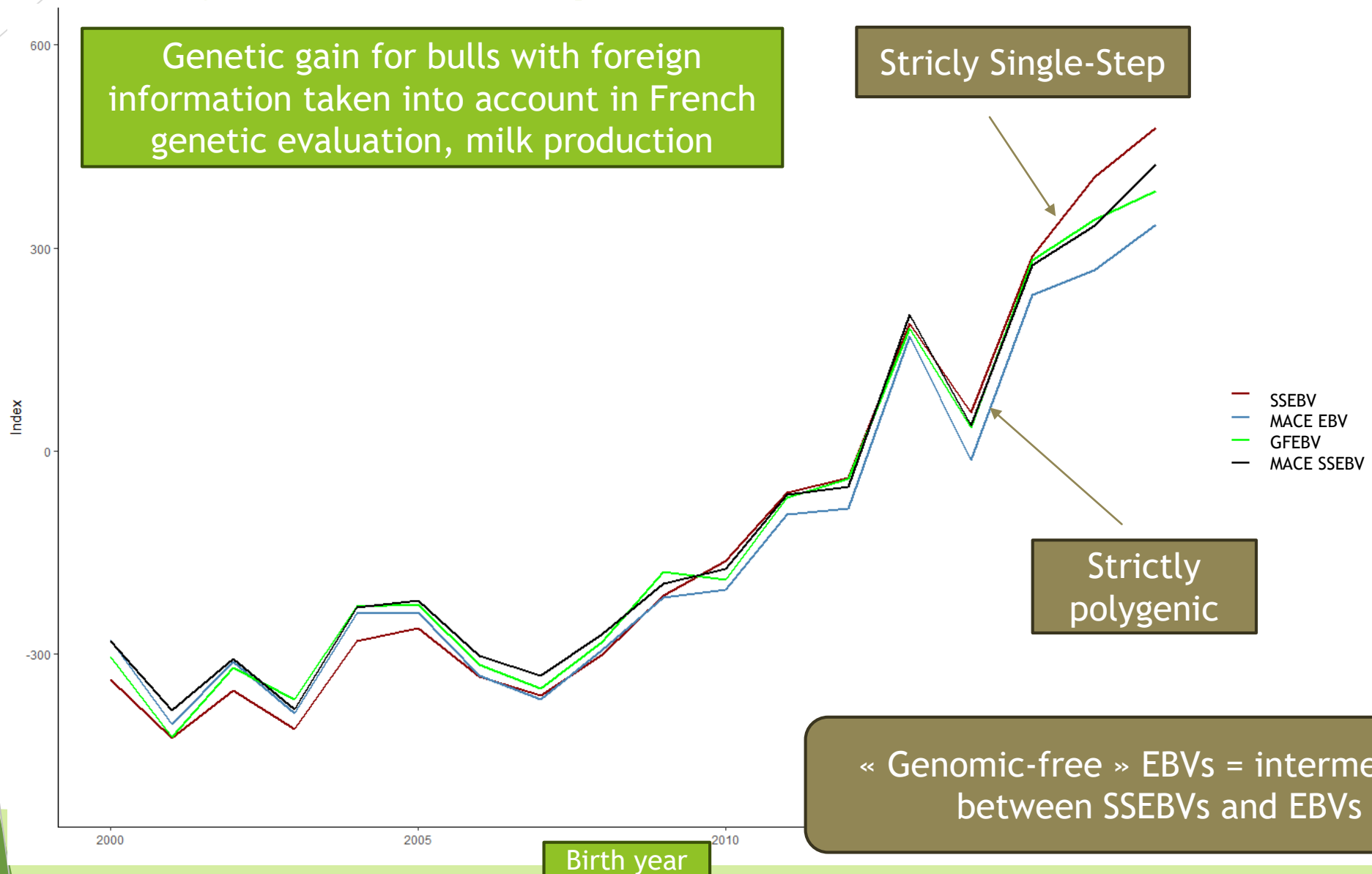
Validation results

- ▶ ... It went well!
- ▶ All traits validated!

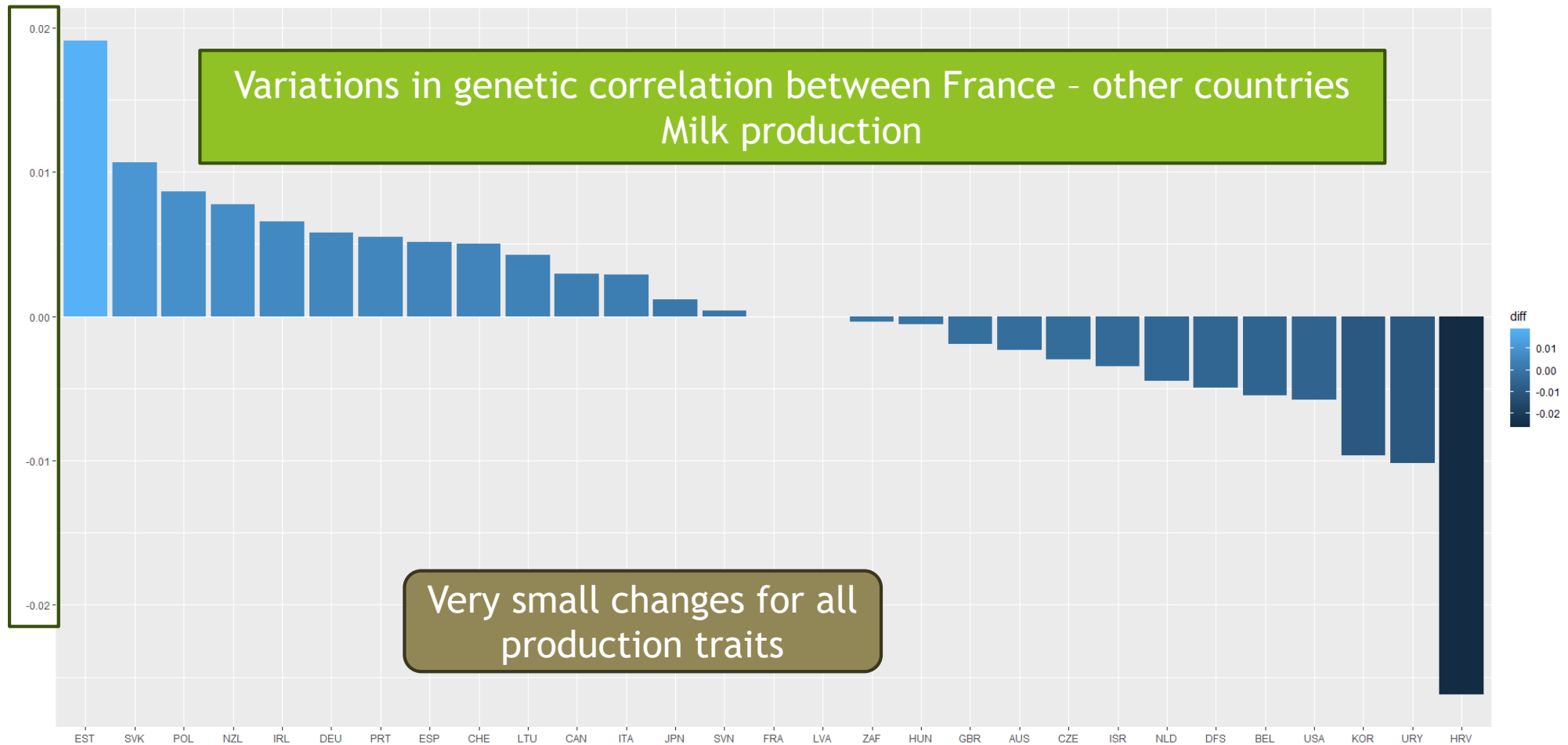


- ▶ Single-Step « genomic-free » indexes sent to MACE in december 2023!
- ▶ Consequences of this change, in France and for Interbull users? Results in Holstein breed.

Changes to be expected... for ITB users

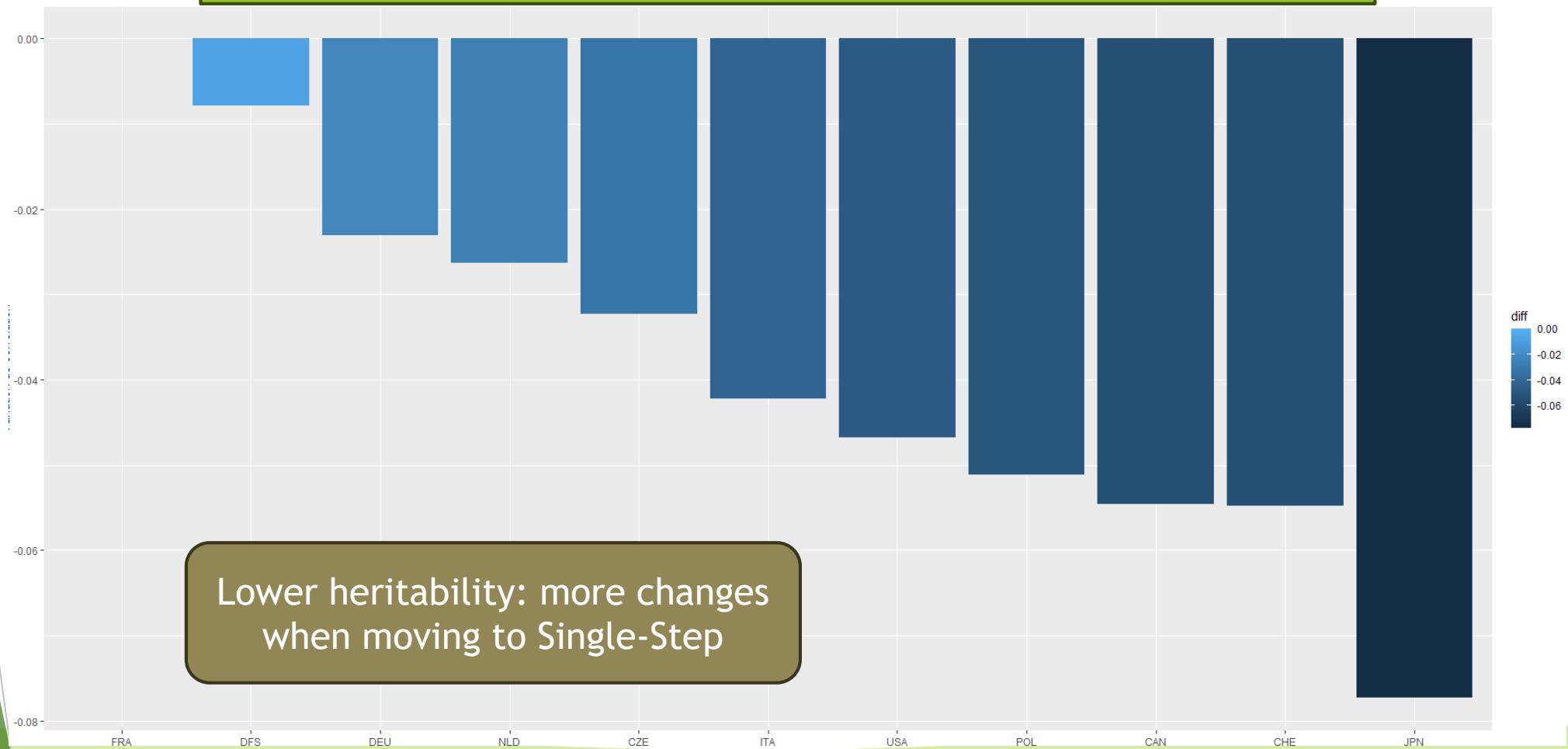


Changes to be expected... for ITB users



Changes to be expected... for ITB users

Variations in genetic correlation between France - other countries
Fertility



Lower heritability: more changes
when moving to Single-Step

Changes to be expected... for ITB users

- ▶ Highest average genetic correlation loss with all other countries

Trait	Average correlation loss
Direct Stillbirth	- 0.10
Direct Calving ease	- 0.07
Foot angle	- 0.06
Heifer conception	- 0.04
Maternal calving ease	- 0.03

Mainly calving traits

- ▶ Other average losses are low

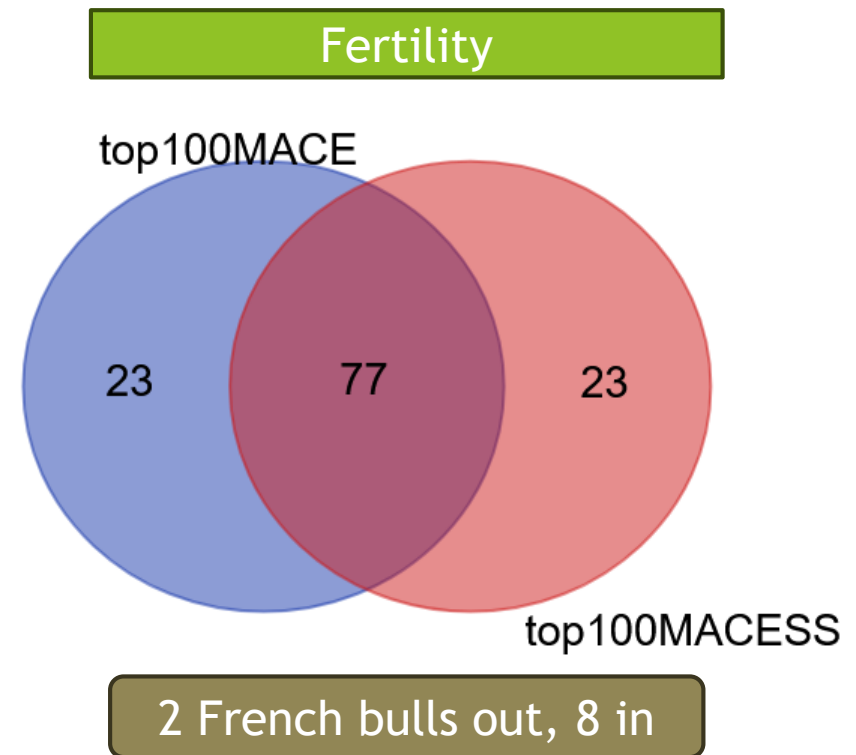
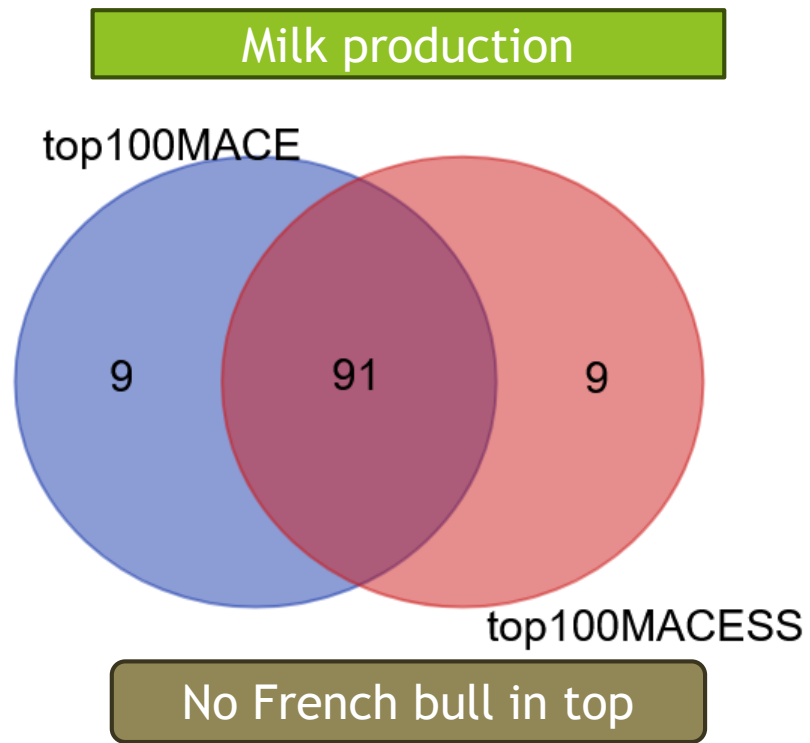
Changes to be expected... in France

- ▶ MACE indexes are sent in country's scale
- ▶ Changes to MACE proofs => changes to indexes received!
- ▶ Is there going to be an impact (again) on French indexes?



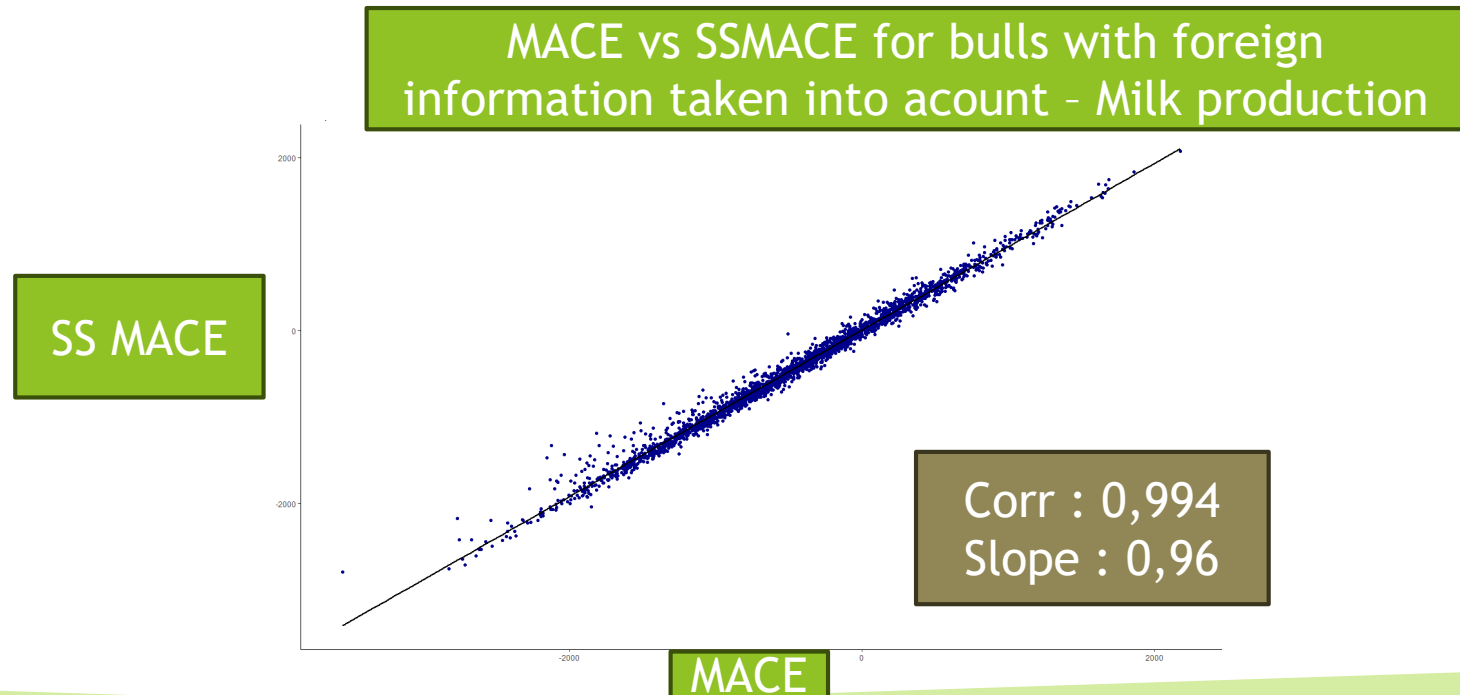
Changes to be expected... in France

- Reranking in top100 bulls used in French genetic evaluation



Changes to be expected... in France

- ▶ More rerankings for low heritability than high-heritability traits
- ▶ Usually in favor of French bulls
- ▶ Rerankings are small in the top: ranking is mostly preserved.



In conclusion

- ▶ All dairy genetic evaluations are routinely Single-Step evaluations in France
- ▶ Since December 2023, French proofs sent for MACE are Single-Step genomic-free proofs
- ▶ Changes are consistent with expectations: slight decrease in correlation with other countries, genetic gain intermediate between Single-Step and polygenic evaluations
- ▶ Rankings are mostly preserved, with some rerankings in the tops => consequences should be small on SSEBVs of French bulls

Thank you for your attention!
Happy to share thoughts and experiences on this topic!