***InterGenomics-Holstein* Letter of Agreement**

**Between**

the *Contributing Organisations*, defined as an organisation willing to contribute genotypes of proven Holstein sires with MACE proof for production traits (referred to as “reference genotypes”) to the InterGenomics-Holstein reference population, each referred to as “*Contributor*”

and the following *InterGenomics-Holstein* Organisations:

* Irish Cattle Breeding Federation (ICBF) – Ireland
* Israel Cattle Breeders Association (ICBA) – Israel
* Slovenian Holstein Association (HOL-SLO) – Slovenia
* National Institute of Animal Science (NIAS) - South Korea

**Table of Contents:**

1. Agreement Purpose
2. Provision of genotypes
3. gEBVs prediction for Contributors’ bulls
4. Access to InterGenomics-Holstein results
5. Exchange of InterGenomics-Holstein Organisations’ national TMI
6. Publication rules
7. Use of Contributor’s genotypes
8. Agreement Implementation, Duration and Termination
9. Execution
10. Acceptance and Signature

* Appendix I: Number of yearly allowable and publishable Contributor’s Genomic Young Bulls in AI.
* Appendix II: Use by InterGenomics-Holstein Organisations at national level of the gEBVs computed thanks to the InterGenomics-Holstein Service.
* Appendix III: InterGenomics-Holstein Service’s Timeline and deadlines.

**Article 1 – Agreement Purpose**

1. The purpose of this agreement is to establish a collaboration between the ***InterGenomics-Holstein*** ***Organisations*** and the ***Contributor*** willing to contribute genotypes of proven Holstein sires with MACE proof for production traits (referred to as “reference genotypes”) to the *InterGenomics-Holstein* reference population.

**Article 2 – Provision of genotypes**

Each party of this agreement agrees:

1. that the *Contributor* and the *InterGenomics-Holstein Organisations* will provide only genotypes for which they have the rights to use for (international) genomic evaluations;
2. that the *Contributor* will provide reference genotypes for the improvement/increase of the *InterGenomics-Holstein* reference population;
3. that the *Contributor* will provide a minimum number of 50 reference genotypes for the access to the *InterGenomics-Holstein* Countries’ markets;
4. that the *Contributor* may furthermore provide a defined number of genotypes for young sires in AI, proportional to the number of provided reference genotypes, as defined in the Appendix I of the present agreement;
5. that the *Contributor* may provide only genotypes for young sires in AI that it owns or controls;
6. that the genotyped animals submitted by the *Contributor* and the *InterGenomics-Holstein Organisations* must have pedigree information in IDEA database.

**Article 3 – gEBVs prediction for Contributors’ bulls**

Each party of this agreement agrees:

1. that sires with genotypes contributed by the *Contributor* will receive gEBVs on all *InterGenomics-Holstein* countries scales for all traits that have been evaluated through MACE for each specific *InterGenomics-Holstein* country;
2. that sires with genotypes contributed by the *Contributor* will not receive gEBVs on the *Contributor*’s scale.

**Article 4 – Access to InterGenomics-Holstein results**

Each party of this agreement agrees:

1. that all *InterGenomics-Holstein Organisations* will receive:
   * 1. SNP equations only in its own country scale;
     2. gEBVs for animals with a genotype provided by the *InterGenomics-Holstein Organisations* in all *InterGenomics-Holstein* countries scales*;*
     3. gEBVs for reference sires with a genotype provided by the *Contributor* in all *InterGenomics-Holstein* countries scales*;*
     4. gEBVs for young sires in AI with a genotype provided by the *Contributor* (regardless of the publication status defined by the *Contributor*) in all InterGenomics-Holstein country scales for all the traits evaluated in MACE by each specific InterGenomics-Holstein country;
     5. the list of all genotyped reference sires’ IDs, regardless the origin of the genotypes;
     6. a report with parentage conflicts including all the genotyped animals submitted by that country;
     7. the report with duplicated genotypes, regardless the origin of the genotypes;
     8. the list of young sires in A.I. IDs the Contributor has identified to be published in each *InterGenomics-Holstein* country.
2. that the *Contributor* will receive:
   * 1. gEBVs of all its genotyped sires on all InterGenomics-Holstein countries scales;
     2. the list of all genotyped reference sires’ IDs, regardless the origin of the genotypes;
     3. a report with parentage conflicts including all the genotyped animals submitted by that country;
     4. the report with duplicated genotypes, regardless the origin of the genotypes;
3. that the *Contributor* will not have access to SNP equations.
4. that the previous conditions (Article 4 - a, b and c) are applicable for both test and routine runs of the *InterGenomics-Holstein* Service.

**Article 5 – Exchange of InterGenomics-Holstein Organisations’ national TMI**

Each party of this agreement agrees:

1. that each *InterGenomics-Holstein* Organisation will compute national TMI for all genotyped young bulls evaluated in the *InterGenomics-Holstein* Service, using the same methods and evaluation values that would be used if such national TMI results were officially published in the Organization’s country, as outlined in Article 6 within the publication obligations of the *InterGenomics-Holstein* Organisation;
2. that each *InterGenomics-Holstein* Organisation will send national TMI of all the genotyped young bulls evaluated in the *InterGenomics-Holstein* Service to Interbull Centre, within two weeks after the Official release of the results of the *InterGenomics-Holstein* routine run;
3. that Interbull Centre will provide to each Contributor the list of its own genotyped young bulls in AI evaluated in the *InterGenomics-Holstein* Service with TMI computed by all the *InterGenomics-Holstein* Organisations, within three weeks after the Official release of the results of the *InterGenomics-Holstein* routine run;
4. that each Contributor will use the TMI received from Interbull Centre for internal management activities, aimed at identifying the genotyped young bulls in AI to be published in each *InterGenomics-Holstein* Country.

**Article 6 – Publication rules**

Each party of this agreement agrees:

1. that the number of yearly *Contributor*’s publishable gEBVs of genotyped young sires in AI depends on the number of reference genotypes provided by the *Contributor* and on the number of yearly national progeny proven sires in each *InterGenomics-Holstein* Country, according to the rules reported in the Appendix I of the present agreement;
2. that the *Contributor* will identify prior to the start of each routine evaluation from among its submitted genotyped young sires in AI those which must be published within each specific *InterGenomics-Holstein* Country, using the *AnimInfo* module available in IDEA (https://idea.interbull.org/). For the avoidance of doubt: those young sires in AI to be published in each *InterGenomics-Holstein* Country may vary between the *InterGenomics-Holstein* Countries;
3. that allthe *InterGenomics-Holstein* Organisations will have access to the list of IDs of young sires in AI for which the Contributor has requested the publication in the specific *InterGenomics-Holstein* Country;
4. that only the *InterGenomics-Holstein Organisations* of thecountries in which the *Contributor* has requested the publication of the genotyped young sire in AI, will be obliged to publish the gEBVs (those obtained from *InterGenomics-Holstein* Service or any other breeding value/selection index computed using gEBVs from *InterGenomics-Holstein* Service) of the identified animals;
5. that the genotype of any young sire in AI identified as publishable by the *Contributor* will be used as a reference sire genotype for the Service once they receive a MACE proof;
6. that *InterGenomics-Holstein* *Organisations* must make publicly accessible (list on the Organisation’s website) the gEBVs of publishable *Contributor*’s genotyped young sires in AI;
7. that *InterGenomics-Holstein* Organisations must advertise, or otherwise recognize, as “InterGenomics-Holstein” all the gEBVs computed thanks to the InterGenomics-Holstein Service.
8. that *InterGenomics-Holstein* Organisations must share with the *Contributors* documentation describing the use at the national level of the gEBVs computed thanks to the InterGenomics-Holstein Service, including the methods used for calculating the national TMI. The documentation’s details are defined in the Appendix II of the present agreement.
9. that *InterGenomics-Holstein* Organisations may decide to publish the gEBVs of *Contributor*’s genotyped young sires in AI in a specific list, different from the one for the national genotyped young sires in AI.
10. that *InterGenomics-Holstein Organisations* can not publish the gEBVs of *Contributor*’s genotyped young bulls in AI not identified as publishable by the *Contributor in their specific Country*.

**Article 7 – Use of Contributor’s genotypes**

Each party of this agreement agrees:

1. That the genotypes provided by the *Contributor* may only be used by the Interbull Centre for the purpose of the *InterGenomics-Holstein* Service, including parentage verification, imputation and for research & development related to *InterGenomics-Holstein* within the Interbull Centre.
2. That the genotypes provided by the *Contributor* must not be distributed to the *InterGenomics-Holstein* Organisations or to any other third party Organisation.
3. That Contributors will have access to results of investigations performed by Interbull Centre or *InterGenomics-Holstein* Organisations on data or results from *InterGenomics-Holstein* Service. Contributors will also be informed in advanced of any public presentation about the *InterGenomics-Holstein Service* or their submitted data.

**Article 8 – Agreement Implementation, Duration and Termination**

1. This agreement shall be signed no later than 16 November 2021 and is valid from the moment it has been signed by each party.
2. During the start-up phase, from November 2020 until April 2022, parties have an obligation to implement the following steps:
   1. All parties shall submit their reference genotypes by the required deadline of 10 November 2020;
   2. *Contributors* shall inform Interbull Centre of the Young Bulls to be published in each country by 15 March 2022;
   3. *InterGenomics-Holstein Organisations* shall implement Article 6h no later than 31 January 2021, and Articles 6f and 6g no later than 6 April 2021;
3. Each party of this agreement has the right to terminate this agreement within a notice time of one year, but not before 31 December 2022. In case of terminations of the agreement, the genotypes of reference sires already provided to the Interbull Centre within the scope of this agreement must remain in the Interbull database and may be used according to the rules of this agreement. Young sires’ or females’ genotypes already provided to the Interbull Centre will be removed from the Interbull database if requested by the party terminating the agreement. If one party terminates the agreement, the agreement still holds for the remaining Organisations.

**Article 9 – Execution**

1. This Agreement may be executed via facsimile or electronically in .pdf format and in counterpart

copies, each of which shall be deemed to be an original but all of which together constitute one

and the same agreement.

**Article 10 – Acceptance and Signature**

1. The undersigned acknowledge and accept the terms and conditions of this Agreement and are

legally authorized to sign on behalf of the respective *Party*.

**Appendix I: Number of yearly allowable and publishable *Contributor*’s Genomic Young Bulls in AI.**

The number of yearly young sires in AI genotypes the *Contributor* can submit and the number of publishable genotyped young sires in AI gEBVs depends on the number of reference genotypes provided by the *Contributor* and on the number of yearly progeny proven sire in *InterGenomics-Holstein* Organisation’s country.

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference Genotypes**  **Contributed** | **Maximum Number of Genomic Young bulls in AI genotypes allowable**  **per year** | **Number of publishable gEBVs per year**  **in Group A countries (\*)** | **Number of publishable gEBVs per year**  **in Group B countries ($)** |
| **50-99** | 10 | 0 | 1 |
| **100-249** | 30 | 1 | 3 |
| **250-499** | 60 | 2 | 6 |
| **500-999** | 120 | 4 | 12 |
| **>999** | unlimited | 8 | 24 |

***(\*) InterGenomics-Holstein* Organisations Group A: <60 progeny proven bulls per year#:**

* Slovenia

***($) InterGenomics-Holstein* Organisations Group B: >=60 progeny proven bulls per year#:**

* Ireland
* Israel
* South Korea

# = average by year of the number of progeny proven bulls in the last 5 years based on MACE input data.

**Appendix II: Use by *InterGenomics-Holstein Organisations* at national level of the gEBVs computed thanks to the InterGenomics-Holstein Service.**

Each *InterGenomics-Holstein Organisation* should specify:

* To which third party (Organisations or Companies) the InterGenomics-Holstein gEBVs are delivered;
* The calculation method and use of the national total merit index (TMI) or other selection indexes of InterGenomics-Holstein gEBVs;
* Criteria for official publication of InterGenomics-Holstein gEBVs;
* Where the InterGenomics-Holstein gEBVs are published;
* Where any non-official InterGenomics-Holstein gEBVs might be made publicly available and for whom;
* Which are the procedures in place to get semen imported in the InterGenomics-Holstein Organisation’s Country.

**Appendix III: InterGenomics-Holstein Service’s Timeline and deadlines according to the Interbull Service Calendar:**

**Interbull Service Calendar 2021**

|  |  |  |  |
| --- | --- | --- | --- |
| 16/11/2021 | TUE | Data reception: Pedigrees, EBVs for MACE & SNP data for InterGenomics | MACE, GMACE & InterGenomics **DECEMBER 2021 Routine Run** |
| 22/11/2021 | MON | Data reception: GEBVs for GMACE & file734 |
| 25/11/2021 | THU | MACE & InterGenomics (genotype-related files) pre-release |
| 30/11/2021 | TUE | GMACE & InterGenomics (genomic-related files) pre-release |
| 07/12/2021 | TUE | Official release: MACE, GMACE and InterGenomics |
| 21/12/2021 | TUE | Data reception: national TMI from IG-HOL members |
| 04/01/2022 \* | TUE | National TMI from IG-HOL members distributed to Contributors |

**Interbull Service Calendar 2022**

|  |  |  |  |
| --- | --- | --- | --- |
| 15/03/2022 | TUE | Data reception: Pedigrees, EBVs for MACE; SNP data for InterGenomics &  Contributors identifying publishable young bulls for IG-HOL | MACE, GMACE & InterGenomics **APRIL 2022 Routine Run** |
| 21/03/2022 | MON | Data reception: GEBVs for GMACE & file734 |
| 24/03/2022 | THU | MACE & InterGenomics (genotype-related files) pre-release |
| 29/03/2022 | TUE | GMACE & InterGenomics (genomic-related files) pre-release |
| 05/04/2022 | TUE | Official release: MACE, GMACE and InterGenomics |
| 19/04/2022 | TUE | Data reception: national TMI from IG-HOL members |
| 26/04/2022 | TUE | National TMI from IG-HOL members distributed to Contributors |
|  | | | |
| 19/07/2022 | TUE | Data reception: Pedigrees, EBVs for MACE; SNP data for InterGenomics & Contributors identifying publishable young bulls for IG-HOL | MACE, GMACE & InterGenomics **AUGUST 2022 Routine Run** |
| 25/07/2022 | MON | Data reception: GEBVs for GMACE & file734 |
| 28/07/2022 | THU | MACE & InterGenomics (genotype-related files) pre-release |
| 02/08/2022 | TUE | GMACE & InterGenomics (genomic-related files) pre-release |
| 09/08/2022 | TUE | Official release: MACE, GMACE and InterGenomics |
| 23/08/2022 | TUE | Data reception: national TMI from IG-HOL members |
| 30/08/2022 | TUE | National TMI from IG-HOL members distributed to Contributors |
|  | | | |
| 15/11/2022 | TUE | Data reception: Pedigrees, EBVs for MACE; SNP data for InterGenomics & Contributors identifying publishable young bulls for IG-HOL | MACE, GMACE & InterGenomics **DECEMBER 2022 Routine Run** |
| 21/11/2022 | MON | Data reception: GEBVs for GMACE & file734 |
| 24/11/2022 | THU | MACE & InterGenomics (genotype-related files) pre-release |
| 29/11/2022 | TUE | GMACE & InterGenomics (genomic-related files) pre-release |
| 06/12/2022 | TUE | Official release: MACE, GMACE and InterGenomics |
| 20/12/2022 | TUE | Data reception: national TMI from IG-HOL members |
| 03/01/2022 \* | TUE | TMI from IG-HOL members released to Contributors |

\* Due to Christmas Holidays Interbull Centre Centre will provide to each Contributor the list of its own genotyped young bulls in AI evaluated in the InterGenomics-Holstein Service with TMI computed by all the InterGenomics-Holstein Organisations within 4 weeks (instead of 3) after the Official release of the results of the InterGenomics-Holstein **December** routine runs.