

## **Proposed Genomic MACE Services from Interbull**

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Approximately 12 countries that participate in Interbull MACE evaluation services are currently offering genomic evaluations for Holsteins. For Interbull to remain relevant into the future, the Steering Committee has emphasized the need for the Interbull Centre to also provide a Genomic MACE evaluation service to its participating countries. Following more than two years of research and development (mostly done by Dr. Pete Sullivan at CDN), Interbull will formally introduce its Genomic MACE evaluation services for the Holstein breed commencing the release in August 2013.

As for the traditional MACE evaluation services provided for more than 10 years by Interbull, there are three components to the proposed Genomic MACE services:

- (1) A validation test for each trait group (ie: production, type, longevity, somatic cell, , calving performance, milkability, female fertility) to ensure national genomic evaluations are not [too] biased. This GEBV Validation Test is similar to what CDN already does annually (referred to as "Backward Validation") and tests both the regression slope and R-Square.
- (2) Inclusion of national GEBV data in a Genomic MACE Test Run, which can only include data from country and trait combinations that have successfully passed the GEBV Validation Test.
- (3) Inclusion of national GEBV data in a routine Genomic MACE evaluation run to be conducted three times per year simultaneous with the existing genetic evaluation release dates in April, August and December. Only country and trait combinations included in the preceding Genomic MACE Test Run can be included in the subsequent routine Genomic MACE run.

For the first official Genomic MACE release in August 2013, the deadline for submitting national genomic evaluations for the required GEBV Validation Test is February 19, 2013. Interbull will conduct this validation test in February and inform each country about which trait groups they have successfully passed for inclusion in the Genomic MACE Test run (results to be released to CDN in late March) and subsequently in the official Genomic MACE Routine run for August 2013.

For the next cycle of this process, it is expected that Interbull will set a date in July for the deadline to submit national genomic evaluations for the next GEBV Validation Test with the Genomic MACE Test run in September and the official Genomic MACE Routine release in December 2013.

### **Concept of Genomic MACE Evaluations**

Traditional MACE evaluations use national evaluations and associated pedigree for progeny proven bulls received from various participating countries to estimate each bull's expected genetic evaluation on all other country scales. Bulls with progeny in multiple countries have multiple but independent progeny proofs for those countries that MACE pools together to estimate the bull's genetic evaluation on all other country scales.

The focus for the upcoming Genomic MACE evaluation service from Interbull is not progeny proven sires but, rather, young bulls that have a genomic evaluation in at least one participating country. In simple terms, the required input for Genomic MACE calculations include the traditional MACE evaluations for progeny proven bulls from all countries (for which there are more than 30 for Holstein), the genomic evaluations for all young bulls evaluated (both candidate and selected genotyped bulls) in each country submitting national genomic evaluations for the Genomic MACE service (for which there are up to 12 countries for Holstein currently) and the associated pedigree for all progeny proven and young bulls submitted. The basic output from the Genomic MACE evaluation system is an estimated genomic evaluation on all (over 30) country scales for young bulls with an official/releasable genomic evaluation in at least one country (of up to 12) that submitted genomic evaluations.

## **Interbull Service Agreements**

In order for any country to contribute national genomic evaluations to the Genomic MACE service, the responsible organization (CDN for Canada) must sign a service agreement with Interbull. This document basically outlines the expected fees to be paid by that organization to Interbull as well as the policy for use and publication of any Genomic MACE evaluations received from Interbull. As it relates to the publication requirements, it is expected that all countries receiving Genomic MACE evaluations, which even includes those countries that did not submit national genomic evaluations, must provide public access to each bull's genomic evaluation on the incoming country's national scale. For countries with national genomic evaluations, the Genomic MACE evaluation would not necessarily be published for bulls with a genotype in that country. In these countries, only young bulls with an official national genomic evaluation in at least one other country would have an incoming Genomic MACE evaluation provided by Interbull that should be published. For countries without national genomic evaluations, which also include countries that may have them but did not submit them to the Genomic MACE service, they too will receive and must publish Genomic MACE evaluations for all young bulls with an official genomic evaluation in at least one other country. Interbull is considering imposing this policy by also revising the existing service agreement for traditional MACE evaluations.

## **North American Situation**

A specific complexity that pertains to both Canada and the United States is the proposed fee structure once there is open access to male genotyping in North America starting April 2013. In Canada, the CDN Board of Directors will address this point at its meeting scheduled for March 2013. In the United States, there seems to be some question (or perhaps expectation) that the Council for Dairy Cattle Breeding (CDCB) would impose a fee payable by foreign bull owners before any Genomic MACE evaluations for young bulls outside North America, Italy and the United Kingdom are published on the US national scale. The complication associated with collecting service fees from bull owners in several countries around the world, combined with the precedence such a policy would set for other countries to impose fees on young genomic US bulls with semen exported internationally, makes this approach highly unlikely. One reasonable alternative, however, would be for national centres such as CDN (or the CDCB in the US) to load the Genomic MACE evaluations for foreign young bulls into their respective database for general query but impose a service fee to the owner for the most elite young genomic bulls to appear on official lists (ie: Young Genomic Bulls Marketed in Canada by GPA LPI) and perhaps to code those bulls without a nationally estimated genomic evaluation differently because they have an Interbull Genomic MACE (ie: IGMACE) evaluation.

In terms of timing, both Canada and the United States will learn by the end of February 2013 the list of trait groups for which each country qualifies for submission of national genomic evaluations into the first official Genomic MACE service from Interbull in August 2013. If either country does not pass the GEBV Validation Test for all (or nearly all) trait groups in Holsteins, then that country may simply elect to not sign the Interbull Genomic MACE Service Agreement at the present time. This strategy may also be elected by either or both countries on a voluntary basis simply to give more time to understand the level of new fees to be charged by Interbull and/or to finalize and implement the new genetic/genomic evaluation fee structure for national services. Either scenario would still allow Canada and/or the United States to join the official Interbull Genomic MACE evaluation service in time for the December 2013 or April 2014 releases.