CDCB Policy

SNP-BASED PARENTAGE VERIFICATION AND CERTIFICATION SERVICES

This policy regulates the use of the national cooperator database and CDCB ICAR-certified services for the purposes of SNP-based parentage verification and the issuing of parentage certification was approved by the CDCB Board of Directors on 12/12/2019.

1. POLICY STATEMENT

The Council on Dairy Cattle Breeding (CDCB) performs SNP-based parentage verification and discovery services routinely at the reception every genotype. Although feedback is sent back to the nominator, this information is primarily used for validation of the information received or to correct/complete the pedigree of the animals with the objective of providing a more accurate genetic evaluation.

In March 2019[1], CDCB became an ICAR-certified SNP-based parentage verification center (also known as "DNA Data Interpretation Center"), and is allowed to issue certificates using ICAR certification logo for parentage analyses based on the less than 200 ISAG parentage SNP panel[2]. Both the ISAG parentage panel and the ICAR certification for parentage validation centers are recognized as standards internationally, and countries are gradually transitioning from microsatellite/SSR/STR-based parentage certificates to SNP-based ones.

Although parentage verification and discovery are routinely performed by CDCB using much more accurate tools (CDCB uses all SNPs available for the comparisons, and verifies parentage using haplotypes), CDCB has developed a service to provide a ISAG SNP panel-based certificate with the certified ICAR parentage verification center logo on it, with the objective to facilitate exchanges of genetic material for our collaborators.

2. PROCEDURE

The service is provided as an SFTP service (and, when possible, API-based requests will be made available), in which the user will submit a file containing the required information for the analysis. Each row of the file will include the animal ID, sire ID, dam ID, an action requested and the source of SNP information (or the actual SNP information).

Animal, sire and dam IDs can have a maximum length of 25 alpha-numeric characters. No formats are required, however, only valid ID17 will be accepted for animals whose SNP genotypes stored in the national cooperator database are requested to be used.

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[1] https://www.icar.org/index.php/certifications/certification-and-accreditation-of-dna-genetic-laboratories/two-new-dna-based-services/dna-data-interpretation-centres/icar-accreditation-of-dna-interpretation-centres/

[2] The ISAG parentage SNPs used by CDCB to perform the parentage verification are the SNPs referred as the "ISAG 200" panel in https://www.icar.org/Documents/GenoEx/ICAR%20Guidelines%20for%20Parentage%20Verification%20and%20Parentage%20Discovery%20based%20on%20SNP.pdf , by excluding the ones in ANNEX 1. A list of the SNPs used (including their expected order) is provided in the area relative to this CDCB service online.

The available **actions requested** are:

- *parentage verification only*: no certificate issued, just confirmation of the parentage based on the most current ISAG SNP panel for parentage verification.
- *parentage verification and certification*: a certificate is issued for any animal, irrespectively of the success of the verification. However, animals with invalid requests or errors in their input, will not receive a certificate.
  Certificates will be issued only electronically and in PDF format.
- *no action*: this option is useful for parents of animals provided for the sole intent of parentage verification. SNPs for these animals are expected to be provided by the user and, although will be eventually used to verify the parentage of an animal, they will not receive a parentage verification or certificate for themselves.

As for the **source of SNP information**, the user can request the extraction of the available ISAG SNP panel from the national cooperator database or directly provide the SNPs to be tested. In the latter case, specific instructions about SNP content, order and coding are provided by CDCB staff in the online service area to ensure the success of the verification.[3]

3. COSTS AND USAGE RIGHTS

The parentage verification and certification services will be provided to our collaborators **at no cost** when all genotypes involved in the parentage verification are <u>usable</u> genotypes extracted from the national cooperator database. Since these animals already paid (or will pay) an initial fee to obtain an evaluation or a parentage verification, the service is intended as an extra benefit of the CDCB collaborators and customers.

In case one or more of the genotypes is provided by the user, the parentage verification will be charged a "*Parentage only*" fee in the most current CDCB fee schedule.

The parentage certificates issued by CDCB can be printed and/or shared to any third-party without CDCB consent. However, for no reason and under no circumstances, collaborators are entitled to re-sell certificates, modify them in part or in full, or extract part of the information contained for any other purpose without written consent from CDCB.

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[3] Note that since the methodology used routinely by CDCB is more accurate, as explained in section 1, it is expected that there will be cases in which the certificate will accept/exclude a parentage relationship in contrast with what the results of the CDCB routine processing. CDCB ICAR certification only includes the ISAG parentage SNP comparisons, and – as of 2019 – there is no possibility of including more SNPs into the comparison.