



ANNEX I

ICAR Rules and Guidelines for Microsatellite Parentage Testing in Cattle

These Rules contain the **minimum requirements** for ICAR accreditation of microsatellite-based DNA parentage testing in cattle.

1) LABORATORY IDENTIFICATION

The applicant must be clearly identified by providing the following:

- a. Name of the laboratory,
- b. Institution if relevant,
- c. Address and country
- d. Contact person at the lab and all information necessary for getting in touch with her/him quickly.

2) EDUCATION AND TRAINING OF LAB SUPERVISOR AND OPERATORS

The minimum requirements for education and training of the laboratory supervisor and senior operator are:

- a. Bachelor degree, or higher, in a scientific discipline for laboratory head or supervisor, and
- b. At least five years of experience in molecular diagnostics for the laboratory senior operator.

Experience is considered a key factor in data production and in the interpretation of results.

3) EQUIPMENT

- a. Equipment used to run and score microsatellite must be described.
- b. The year of purchase and last revision must be provided - this allows ICAR to evaluate the appropriateness of the technology being used and ensure each lab is following a proper maintenance program that should enable it to generate high quality data.
- c. Yearly revision is considered a minimum requirement.

Advice is available on request to assist with implementing improvements in quality standards.

4) CERTIFICATION

- a. International ISO17025 or ISO9001 is a minimum requirement for ICAR accreditation.
- b. Please note that applications made for granting of ICAR accreditation from 2022 will require ISO 17025 accreditation. ISO9001 will no longer be accepted.

5) PARTICIPATION AND PERFORMANCE IN RING TEST

- a. The participation and performance in ISAG and national ring (comparison) tests must be disclosed, and certificates provided, when available. Applicants must also sign a release allowing ISAG to directly disclose their ring test results to the ICAR DNA Committee.
- b. The participation in the most recent ISAG ring test and at least two ISAG ring tests is a minimum requirement.
- c. Beginning with the 2009-10 ISAG ring test, lab typing performance for the official set of 12 ISAG



- d. Microsatellites (see Annex III) must be disclosed (previous ISAG ring test reporting can be limited to 9 microsatellites).
- e. The Committee of Experts will decide performance thresholds for each ring test with due consideration for the structure of the ring test and the average performance of laboratories in the ring test that year.

6) MICROSATELLITE MARKERS

- a. The names of all microsatellites typed on all animals (marker set I) and of the additional ones assayed in the case of unresolved parentage (marker set II) must be declared, as well as the number of animals typed in at least the last two years.
- b. The minimum requirement for international exchange is the complete set of 12 official ISAG microsatellite markers.
- c. To ensure sufficient experience within the lab, analysis of 500 animals per year is set as minimum requirement for certification.
- d. Exclusion probability (PE; 2 parents and 1 parent) of each marker and of the complete marker sets must be calculated and provided in the application. The type of population and number of animals (minimum 150) used for computations are to be described. ICAR recommends using Holstein as a reference group when possible. The ICAR Committee of Experts will evaluate that an appropriate PE is reached for accreditation, on the basis of the population analyzed.

7) MARKER NOMENCLATURE

- a. Nomenclature of markers must be described.
- b. ISAG nomenclature is required for the official ISAG 12 marker set.