

SECTION 1.1 – ICAR GUIDING PRINCIPLES ON METHODS OF IDENTIFICATION

Commento [hr1]: *Replace existing paragraphs and headings with similarly numbered paragraphs below (in black) SECTION 1 – GENERAL RULES*

Replace existing paragraphs 1.1.1 through 1.1.4 from 2016 Guidelines with the complete text below (including paragraph headings).

1.1.1 ICAR Guiding Principles for animal identification

- 1 The recorded animal identity should be the animal's official identity in the member country and should be unique to that animal
- 2 Where the identity of an individual animal is not unique, the record must so state (e.g. flock or herd identity for sheep/goats). The identity number used for a flock or herd must be unique to that flock or herd.
- 3 The animal's identity should be visible to the naked eye, or if not visible (such as an electronic or Radio Frequency Identity (RFID)) should be cross-referenced to a visible or human readable identity.
- 4 The animal's official identity must remain unique and never be re-used.
- 5 The animal's identification device or method must comply with the local or legislative requirements of the country concerned.
- 6 Animals who lose their identity device or whose identity device becomes dis-functional, must be re-identified wherever possible with their original identity, provided there is evidence that the animal is being correctly identified. Where it is not possible to re-apply the original identity, a cross-reference to the original identity must be maintained.

1.1.2 ICAR standard methods of animal identification

- 1 The animal's identity may be attached to or implanted in the animal by tag, tattoo, sketch, photo, brand, or electronic device
- 2 Animals moving from one country to another should wherever possible, continue to be identified using the identity (and name where applicable) from the country of origin. Provided that identity remains compliant with legislation in the importing country.
- 3 In the case of imported animals, where local or national legislation of the importing country requires the original identity to be changed or replaced, the official records should also hold the original identity and name. The original identity and name should be quoted in export certificates in addition to the replacement identity and also in AI catalogues or catalogues of important international shows or sales.

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1.1.3 Record of Identification Methods

- 1 The member organisation must maintain a record of the identification methods used in the country or countries in which it operates.
- 2 The member organisation must determine, within the constraints of local or national legislation within the country or countries in which it operates, the identification methods used on recorded animals and herds or flocks.

1.1.4 Recognized ICAR Standards for animal identities

- 1 Specific guidelines for use in data exchange for genetic evaluation (Interbull or International Identity) and on printed documents, electronic documents, web pages or any other places where genetic evaluation results may be provided are defined in section 9.
- 2 Details of standards for Electronic Identification Devices can be found in section 10.
- 3 Details of the supported standards of animal identification used in electronic exchange of livestock data, particularly between local, on-farm devices and computers, can be found in section 15.

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3.1.2.3 Principles of beef data recording

It is essential that some basic principles should be taken into account in beef recording practices to improve recording efficiency, data storage, data exchange and usability of the animal's performance data.

Throughout the whole recording process, there are four essential key pieces of information which should be included in any animal's data record:

- 1 The unique identification of the animal.
(Particular attention is drawn to section 9.1.1 of these Guidelines)
- 2 The date of recording.
- 3 The identification of the location (farm, station).
- 4 The identification of the recorder (recording person).

It is desirable therefore for practical reasons to allocate standardized unique identification to each animal, to locations (e.g. a holding ID) and to recording personnel. The animal's holding identification together with recorder identification provides information which allows for the correction for environmental effects and therefore is needed for statistical analysis and genetic evaluation. Furthermore the information in respect of the recorder (recording technician) allows for identification of recording methods (A = recording by official technicians; B = recording by the keeper; C = mixed systems), in accordance with the general ICAR standards and guidelines.

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In general, details relating to an animal can be categorised into four different types as follows.

3.1.2.3.1 Invariable data

There are 3 groups of invariable data:

3.1.2.3.1.1 Invariant animal data

This includes all data that are specific to an animal, are available at the birth of the animal and do not change during its lifetime. This set of data comprises at least:

- The identification of the animal.
- Birth date.
- Birth location.
- Birth type (single, twins, triplets etc.).
- If the animal is an identical twin or a clone, the identities of the other genetically identical animal(s).
- Sex.
- The breed or breed composition.
- The identities of the animal's genetic parents.
- Information in respect of embryo transfer if applicable.
- Identity of recipient dam in case of embryo transfer.
- Information in respect of fostering if applicable.
- Identity of foster mother case of fostering

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3.1.2.3.8 Data requirements for the calculation of genetic evaluations.

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In most cases the required data formats for trait information, fixed and random effects and pedigree information are clearly defined in the genetic evaluation system. The data file should be provided in a standard format. Where raw data is subjected to ongoing maintenance which allows for changes of historical data (e.g. change of parentage, fixed effects etc.), submitted data for genetic evaluation should include all animals of the relevant population rather than just a subset of new or recently recorded animals.

Data for the calculation of genetic evaluations should comprehensively account for management conditions and other non-genetic effects affecting the animal's performance. Much attention should be paid in the definition of contemporary groups held under similar management conditions. However, the definition of contemporary groups frequently will be a compromise between a precise specification of the group with possibly loss of contemporaries on the one hand and a wider specification with loss of information accounting for fixed effects.

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Usually the pedigree file is a separate file containing the animal identification and those of its parents together with breed sex and birth date. The pedigree file should contain all animals contributing to the genetic structure of the breeding population. Where pedigree data originates from separate regional or historical sub-populations or separate databases, it may happen that different identities and/or different names may have been allocated in those databases to occurrences of the same animal.

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Therefore special consideration should be given to identifying and attaching unique ID numbers to the relevant animals in all databases. Particular attention is drawn to section 9.1.1 of these ICAR Guidelines.

There are some special situations which need to be taken into account:

- In case of identical twinning and cloning, or similar techniques such as embryo splitting, it is necessary to record the fact that two or more individuals are genetically identical, since on the basis of pedigree information alone (the same parent identities), these animals would be falsely identified as full siblings.
- In genetic evaluation systems it is common practice to include genetic groups for founder animals. Animals with unknown parents are grouped according to age (year born), country of origin and/or breed composition (if more than one breed is included). Therefore, it is essential to record this data especially for older animals in the pedigree

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3.1.3 Specific recommendations for data collection

3.1.3.1 Identification

3.1.3.1.1 Animals

Animal identification is outlined in detail in section 1.1. of the ICAR International Agreement on Recording Practices / ICAR Recording Guidelines. The following chapter therefore only provides a brief overview on the most important aspects for identification issues. More details can be found in the relevant International Agreement.

Having decided on which performance traits are to be measured, it is then vital that a system is adopted that successfully records data relating to an individual animal and allows it to be transferred to the body responsible for genetic evaluation. The key to this success is unique individual animal identification. The approach taken in the EC for national identification systems is to have a two-character code for the country and then a numeric code for the individual that may incorporate geographic and herd information in addition to the animal number. Within Breed Associations and Herdbooks, numbering systems are frequently used allied to ear tags, tattoos or to the national / legislated identity of each animal. Where the Breed Association or Herdbook identity is different from the national/governmental identity of the animal, then one numbering system must be agreed as the definitive identifier and used in data collection, international communications and genetic evaluations concerning an animal.

It is strongly recommended that the International Animal Identity is considered for these purposes. As defined in section 9.1.1.2 of these ICAR Guidelines.

Where an official governmental identification system is in place, it is recommended that this identification is integrated with the National and International identity of each animal, wherever possible.

Each newly born calf should be tagged with its unique identifier as close to birth as possible, compatible with local legislation and animal welfare standards. Ideally this should be within 24 hours of birth but could be up to 30 days provided some temporary measure is taken to ensure its identity is not confused with cohorts. The animal's identity may be attached to it by, a tag, tattoo, sketch, photo, brand or electronic device. The preferred methods of attachments are those least likely to be confused or lost. Dual identification with a combination of methods or duplication of one method is recommended for insurance, in the case of loss or malfunction of one of the identification devices (for example separate tags in each ear, or visual plus electronic ID).

Standards for the identification of animals by electronically readable devices are contained in ISO 11784 and 11785 and in sections 9 and 10 of these ICAR Guidelines. Details of the supported standards of animal identification used in the electronic exchange of livestock data, particularly between local, on-farm devices and computers can be found in section 15.

Animals that lose their identity must be re-identified, wherever possible using their original identity. If doubt over that identity exists then all possible efforts should be taken to determine the original identity. The use of DNA genotyping from known (or suspected) relatives should be considered.

For the purposes of performance recording it is essential that the records of calves that are born dead or, die shortly after birth are entered in the system. This can be done without identification of the dead calf if the relevant calving is recorded as an event of the appropriate dam.

Cattle that move from one country to another or become parents to offspring in another country (through AI or ET) should continue to be identified using their original identity (and name if appropriate) or their International Identity where that is more appropriate.

In the case of imported animals, where the number has been changed or re-identified to meet local legislative requirements, the official records should also show the original name and number. The original name and number must be reported on Export Certificates, AI catalogues and show and sale catalogues.

The responsible organisation must maintain a data base that links each animal's identity to its own performance records and to the identities of its parents. In the case of embryo transfer the genetic parents and the surrogate/recipient dam identities should all be recorded.

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Eliminato: Compared to the visible animal ID, a 3-digit ISO country code may replace the alpha country code for data storage and data transfer. In accordance with ISO 3166, the resulting number is composed of 15-digits where the first 3 digits represent the country of birth and the remaining 12 digits represent a unique number within the country of origin. Leading zeros are recommended to fill up to 12 digits

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3.1.3.1.2 Parentage recording

Parentage recording is outlined in detail in section 1.2. of ICAR's International Agreement on Recording Practices. The following section only aims to provide a brief overview on this subject.

The identity of the animals served and the service sire must be recorded on the farm on the day of service for AI. For groups of cows bred by natural service the expected parents should be noted and confirmed or deleted at pregnancy diagnosis. The record must contain the identities of the sire and dam including names where available, the breed or breed cross and the date of mating where AI is used or a natural mating was witnessed. If the mating was not witnessed a record of the period the dam and sire were kept together should be made.

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To verify the parentage record the cow served and the service bull must be properly identified and exist in or be entered on to the database. The gestation length, where it can be calculated should be within +/- 6% of the average gestation length for the breed of the service sire. The service bull must be verified by an AI record or evidence that the sire was on the farm on the day of service or, in the case of ET, a declaration by the supervising Veterinary Surgeon should be available in respect of the required information.

It is recommended that all mating details be notified to the database as soon as possible after the mating event. This will provide the basic information needed to evaluate a range of fertility traits and may help to identify fertility problems early. It is recommended that the mating details should be reported at least within sixty days after the mating. This will help to minimise errors in pedigree and provide useful fertility and gestation information.

Visual inspection or DNA analysis of the progeny may be carried out to confirm parentage.

SECTION 9 – ICAR STANDARD METHODS OF GENETIC EVALUATION

9.1.1.2 The International Identity used in data exchange for bovine genetic evaluation

1. Animals should be identified in accordance with the Guiding Principles set out in section 1.1 of the International Agreement of Recording Practices. Particular attention is drawn to the official identity given to an animal remaining unique to that animal at all times, used throughout the life of the animal, both in the country of birth and also by all other countries and never be used again for any other animal of the same or different species.
2. The **International Identity** of the animal used by Interbull for bovine genetic evaluation purposes and for interchange of bovine evaluation data, is composed of a 19-character string comprising the following components:

<i>Item</i>	<i>Length</i>	<i>Position</i>	<i>Summary / Description</i>
Breed	3 character	1 – 3	The three-character breed code as defined in paragraph 9.1.1.1 and the Appendices to these guidelines, Section 8.
Country / Nationality	3 character	4 – 6	The three-character country code in accordance with ISO 3166, representing country of birth or other primary nationality as deemed by Interbull (<i>see points 4-8 below</i>).
Sex	1 character	7	A single character gender code (M=male, F=female)
Animal Identifier	12 character	8 - 19	A 12-character, alpha-numeric (A-Z, 0-9) animal identity. Frequently the same as or close to that used in national identification systems. (<i>See points 5 to 7 below</i>)

3. All component parts of the International Identity of the animal should be kept intact. If for any reason, modification of the original animal identity becomes necessary, it should be considered as a re-identification and fully documented by a cross-reference table relating the original animal identity to the new animal identity. Such cross-reference information to be made available on request by the authority or organization which makes or authorizes the re-identification to ICAR or other ICAR affiliated or subsidiary organization, including Interbull, along with the original or master identity of the animal.
4. The primary International Identity of the animal and its Nationality component, shall normally be those assigned from birth. Or as deemed by Interbull from time to time, country of primary registration may be used, where that is not the same as an animal’s country of birth. Attention is also drawn to paragraph 10.2.5.4 of these Guidelines, discouraging the use of RFID device manufacturer identity codes in this context.
5. The Animal Identifier component used will often correspond to the identity used in National or other local identification systems such as those mandated or permitted by local legislation. The National identity used may be modified where necessary to enable it to fit the criteria listed here in points 6 to 8 consistent with a unique International Identity being maintained.
6. **Permitted characters.** The Animal Identifier component should consist of 12 alpha-numeric characters (including check digits where used), with leading zeroes inserted where the national or other official identity being used is initially less than 12 characters. These 12 characters should contain only ASCII upper case letters A-Z or numbers 0-9.

The following characters should NOT be used in the International Identity of the animal:

- a) spaces, lower case letters,
- b) language specific or other script specific or non-ASCII alphabetic special characters,
- c) graphic signs used as field separators in data handling, i.e. dot (.), comma (,), semi-colon (;), colon (:), backslash (\), forward slash (/), tilde (~), asterisk (*) or hyphen (-).

Guidelines: ICAR Standards for animal identities – proposal from Animal ID SC June 2016

7. Where the identity of the animal used in a national identification system originally includes a country identifier using a 2-character ISO 3166 country code (for example as part of a visible eartag identity), then it is recommended this country code be omitted from the International Identity and the equivalent ISO 3166 3-character country code be used instead, in positions 4-6 of the International Identity. Reason: for simplicity of the International Identity and to avoid clashes or possible conflicts between the country of birth/nationality used in positions 4-6 as deemed by Interbull and the eartag nationality such as may appear in tags used in some counties for imported animals and/or replacement tags.
8. Where the identity number of the animal used in a national, electronic or RFID identity scheme includes the ISO 3166 3-digit numeric country code then it is normally preferable to use the equivalent ISO 3166 3-character alphabetic country code in the Nationality component of the International Identity of the animal, used for genetic evaluation. However, in situations where this may compromise the uniqueness of the overall International Identity so derived, then the ISO 3166 3-digit numeric country code may be carried forward from the national electronic identity to the Nationality component of International Identity in place of the preferred 3-character ISO 3166 country code. E.G. USA vs. 840.
9. By preference, the full 19-character International Identity should also be shown in printed documents, electronic documents, files, web pages and other media where the genetic evaluation results are also displayed or contained.

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SECTION 10 – TESTING OF DEVICES USED IN ANIMAL IDENTIFICATION

Note for Animal ID SC and Guideline editors – This paragraph 10.2.5.4 has been incorporated into section 10 already. Since Berlin meeting 2014.

10.2.5.4 The use of Manufacturer codes and Country codes

Manufacturer codes (900-998 series) should only be used in connection with electronic identification (RFID) devices, in accordance with ISO 11784 and section 10 of these Guidelines, including Annex 10.2.2 Code of Conduct for RFID device manufacturers.

Where a competent national authority has assumed the responsibility for ensuring and maintaining the uniqueness of the RFID identification code for a specific species in that country, the ISO 3166 3-digit numeric country code may be used in place of the manufacturer code in the electronic identity or RFID of that specific species of animal.

The use of manufacturer codes in the International Identity used for genetic evaluation purposes is discouraged (Section 9.1.1.2).

Commento [hr2]: – Changes to section 10 and the inclusion on paragraph 10.2.5.4 are now handled by a separate text within the section 10 document itself, so the revised paragraph 10.2.5.4 below is included here purely for reference. No further action is necessary on this paragraph.

SECTION 15 – ELECTRONIC DATA EXCHANGE FOR LIVESTOCK

15.4.2 Animal Identification and Animal Number

Commento [hr3]: Replace the following numbered paragraph with the full text below:

15.4.2.1 Supported Standards

The amount and frequency of exchanged data require a shared and reliable animal identification. As the same animal may have several different identifiers or animal numbers at the same time for different purposes (e.g. for equipment, for authorities, for herd books.....) and some identifiers may change during the animal's lifetime. (More information on the latter aspect can be found in section 9.1.1).

The following principles should be followed:

1. The animal number or identifier to be transferred between items of equipment or from transceiver to database should be that which is stored by the transponder used by the equipment.
2. The animal number or identifier chosen according to application, species and type of equipment taking part in the transfer should be in accordance with one of the following standards:
 - a) For local communication between automated on-farm equipment and other similar devices: a six digit animal number in accordance with ISO 11788-2 registered by a transponder provided under the responsibility of the equipment manufacturer, or (b).
 - b) For electronic identification (RFID) devices and other equipment using the same animal identifiers: The 15 digit RFID animal identity number starting with either the 3-digit numeric RFID device manufacturer code or with the ISO 3166 3-digit numeric country code, in accordance with an ISO 11784 ICAR approved RFID transponder.
 - c) For communication in respect of national or international genetic evaluation: The 19 character International Animal Identity used for data exchange in genetic evaluation, as defined in section 9.1.1.2

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