INTERNATIONAL COMMITTEE FOR ANIMAL RECORDING

http://www.icar.org/

1. PREAMBLE

1.1. - The International Committee for Animal Recording (hereinafter referred to as ICAR) is an international non governmental organisation. The purpose of ICAR is to facilitate the extension and standardisation of methods of recording animals. ICAR's aims and functions are detailed in its Constitution.

1.2.- In recognition of national and international legislation affecting its members, ICAR will as far as possible incorporate legal agreements into its regulations, provisions and recommendations.

1.3.- The regulations, provisions and recommendations laid down in this agreement are regarded as the minimum requirements for satisfactory recording within the aims of ICAR. More comprehensive requirements apply to the use of the ICAR Special Stamp.

1.4.- The agreement is designed to allow member organisations a degree of choice and flexibility within the regulations and provisions, while ensuring that there is a satisfactory degree of uniformity within the record keeping methods among member organisations.

1.5.- Regulations and recommendations may be supplemented from time to time by additional provisions agreed by ICAR.

2. GENERAL RULES

2.1.- Any new member organisation shall adopt and satisfy the Agreement within two years of taking up membership.

2.2.- Each member organisation shall submit its recording rules in one of the official languages and its Annual Report to the Secretariat.

2.3.- Full Member Organisations adopting and satisfying this agreement and fulfilling the rules for the use of the Special Stamp, has the right to use the Special Stamp of ICAR on its records certificates and in its publications.

2.4.- Any Full Member Organisation wishing to withdraw from the agreement, or withdrawing its recognition of a recording organisation, shall notify the Board in advance of the date of its planned withdrawal. The Board will then immediately notify all other member organisations of that fact and of the date of withdrawal.

2.5.- The Board may revoke the recognition of a member organisation if the latter ceases to satisfy this agreement.
3. REGISTRATION OF RESULTS AND AUTHENTICATION OF RECORDS

3.1.- Official records shall be calculated by one of the methods defined in the appendices.

3.2.- The member organisations shall report to the ICAR Secretariat the data items that are recorded, together with the recording methods and the calculation methods used (as defined in the appendices).

3.3.- The recording organisation should record and report additional information that will be useful to monitor the accuracy and authenticity of records.

4. CERTIFICATES

4.1.- Certificates containing recording results may only be issued with the approval of the relevant Full Member Organisation.

4.2.- An official certificate should contain the latest information.

4.3.- If available, information described in the appendices should be printed on the certificates.

5. RECORDING: BASIC PRINCIPLES

5.1.- Records should be a true indication of the identity, sex, breed, ancestry and date of birth of the animal. Only information recorded in the manner and to the standards of the Agreement shall be presented as the official record.

5.2.- The recorded animal must be identified in accordance with the animal identity regulations pertaining in that member country.

5.3.- Parentage, production traits and other characteristics including health traits shall be recorded in accordance with the Agreement. Recording standards for each trait are given in the appendices.

6. ORGANISATION OF RECORDING

6.1.- Organisations carrying out recordings are free to determine their particular recording methodologies provided these are in agreement with the ICAR rules.

6.2.- The Full Member Organisation shall ensure that there is satisfactory supervision of any recording organisation recognised by the member concerned, as defined in the appendices.

6.3.- Recording Operations

6.3.1.- Recording can, subject to the consent of the member organisations, be undertaken by any of the approved ICAR methods contained in the appendices.

7. THE RECORDED HERD

7.1.- Any group of animals kept for the same purpose and at the same location shall be regarded as a whole herd. For a record to be considered an official record, the whole herd as defined above must be recorded.
7.2.- The recorded herd can be divided into separately recorded groups of animals, provided that those groups of animals are of clearly distinct breeds or crosses or are managed in significantly different ways at different locations.

8. RECORDING OF PARENTAGE

8.1.- The parentage of an animal shall be recorded by identifying and recording the service sire and the served animal at the time of service. The identity, sex and date of birth of an animal, shall be recorded as soon after parturition of the dam as possible.

8.2.- Rules for parentage recording are given in the appendices.

9. RECORDING MILK AND MILK CONSTITUENTS

9.1.- The A4/2 milkings method is the ICAR standard reference recording. Any other approved method of recording (as given in the Appendix) may be used, but the results should be mathematically related to the reference method and a relative reliability factor quoted (see Appendix).

9.2.- Milk recording can be done at one or more milkings. Relevant symbols to be used are given in the Appendix.

9.3.- Full Member Organisations are expected to observe the following recommendations.

9.3.1.- Milk yields should be recorded and milk samples collected using equipment approved or provisionally approved by ICAR.

9.3.2.- The list of approved and provisionally approved equipment is included in the Appendix and is monitored and updated by the Secretariat and made available to member countries from time to time.

9.3.3.- The equipment, materials and methods used for analysing the contents of recorded milk are referred to in the appendices.

9.3.4.- The accuracy of the equipment used for milk recording and analysis must be checked by an agency approved by the member organisations, on a regular and systematic basis using methods approved by ICAR. The list of methods is given in the appendices.

9.4.- The analyses of the chemical composition of a milk sample shall be carried out on the same milk sample. These samples should represent the 24 hour milking period or have been corrected to a 24 hour period by a method approved by ICAR.

9.5.- Duration of recording: the lactation period

9.5.1.- Only approved lactation periods can be used. The Appendix to the Agreement contains a list of approved lactation periods.

9.5.2.- The reference lactation period shall be as described in the appendix.

9.5.3.- Apart from the reference lactation period, performance records may also be presented for other recording periods e.g. annual yields.
9.6.- Calculation methods
9.6.1.- The quantities of milk and milk constituents shall be calculated according to one of the methods outlined in the appendices.
9.6.2.- Member organisations shall inform the Board of the calculation methods being used by the records processing operations in their country and shall be responsible for ensuring that the records are corrected and calculated as specified in the Appendix.

10. RECORDING ADDITIONAL TRAITS FOR BOVINES AND OTHER SPECIES
10.1.- The traits should be recorded in the manner defined in the appendices.

11. GENETIC AND OTHER VALUATIONS
11.1.- Shall be calculated using one of the methods detailed in the appendices.

12. PUBLICATION OF RESULTS
12.1.- Published records should furnish a true indication of an animal's performance, parentage and genetic merit. Official records and certificates may be issued only by member organisations and by organisations approved by them.
12.2.- All published official records should be to a standardised basis as described in the Appendices.
   12.2.1.- In all cases the publication of the official record should indicate the methods used as given in the appendices.
   12.2.2.- Where the record includes estimates of missing data, it must so state.
   12.2.3.- The breed, sex and unique identity of the animal and the sire and dam of the animal and of their sires and dams and the animal's date of birth, should be shown on the official records, where these are known to the Recording Organisation.
   12.2.4.- Where the record has been significantly affected by the health of the animal, the record should so state, for example, by severe lameness, sickness, mastitis or other disease.
   12.2.5.- Where the record has been significantly affected by an unusual management practice and/or environmental conditions, the record should so state. For example, where animals have completed all or a part of the lactation period in the mountains.
12.3.- Details for the publication of milk records are given in the Appendix.
APPENDICIES

Appendices to the International Agreement of recording practices

The following Appendices constitute part of this Agreement and may be changed from time to time.

Section 1.- General Rules
   Appendix A.- Methods of identification
   Appendix B.- Parentage recording methods
   Appendix C.- Methods of recording performance
   Appendix D.- Individual animal certificates
   Appendix E.- Supervision of recording
   Appendix F.- Registration of recording methods with ICAR

Section 2.1.- Milk Recording - General
   Appendix A.- Recording intervals
   Appendix B.- Symbols used on records
   Appendix C.- Methods of lactation calculation
      Annex 1.- Calculation examples by using the interpolation method
   Appendix D.- The lactation period (LP)
   Appendix E.- Missing results an/or abnormal intervals

Section 2.2.- Milk recording - Special regulations

Section 3.- Meat recording
   Appendix A.- Beef performance recording

Section 4.- Other production traits recording

Section 5.- Conformation recording
   Appendix A.- Conformation recording of cattle
      Annex 1.- Conformation recording in Black and White cattle

Section 6.- Fertility recording
   Appendix A.- Fertility recording in cattle
      Annex 1.- The assessment of the productive performance of bulls and cows

Section 7.- Health recording

Section 8.- Other non productive traits recording

Section 9.- Data definitions and data transfer
   Appendix A.- List of breeds of cattle
   Appendix B.- Semen straw identification

Section 10.- Methods of genetic evaluations
   Appendix A.- Methods of genetic evaluation in cattle
Annex 1.- Recommended procedures for international use of sire proofs

Section 11.- Approval of test centres, devices and equipment

Appendix A.- The approval and checking of milk recording equipment
Appendix B.- The approval and checking of milk analysis equipment
Appendix C.- Electronic identification guidelines for transponder injects and attachments

SECTION 1

APPENDIX A: METHODS OF IDENTIFICATION

Basic Principles:

1. The recorded animal identity, must be the animal s' official identity in the member country and must be unique to that animal.

2. Where the identity of an individual animal is not unique, the record must so state (e.g. flock identities for goats/sheep). The identity number used for a flock or herd must be unique for that flock or herd.

3. The animal's identity must be visible.

4. The animal's identity should be unique and never be reused.

5. The animal's identification device/method, must comply with legislative requirements.

Additional Details:

a) The animal's identity number may be attached to the animal by a tag, tattoo, sketch, photo, brand or electronic device.

b) Animals which lose their identity device must be re-identified and, wherever possible, with their original number, provided that there is evidence that the animal is being correctly identified (where this is not possible, a cross reference to the original number must be maintained).

c) Animals moving from one member country to another should, wherever possible, continue to be identified using their original identity number and name.

d) In the case of imported animals, where the number has to be changed, the official records should also show the original number and name. The original number and name must be reported in Export Certificates, AI Catalogues and in catalogues of important shows and sales.

e) Where an animal is identified using an implanted "electronic device", the animal must be marked in a way which indicates the presence of an "electronic identification" device.

Record of Identification Methods:

a) The member organisation must maintain a record of the approved identification methods used in the member country.
b) The member organisation must determine, within the constraints of the member country legislation, the identification methods to be used on recorded animals and herds or flocks.

**Standard Identities:**

a) The animal identity number will be a maximum of 12 digits (including check digits where used) and the ISO country code shall be added to identify the country of origin. Three digit numeric ISO codes must be used for data transfer and storage. In printed documents the ISO alpha country code should be used.

b) For Electronic Identification Standards see Appendix C in section 11.

**APPENDIX B: PARENTAGE RECORDING METHODS**

**Recording of Parentage Information:**

1. The identity of the animal served and the service sire must be recorded on the farm on the day of the service.

2. The insemination records issued by the AI Organisation (or the records kept by the DIY AI user) must include the date, the official identity and if available the name of the served animal and the identity and name of the service sire.

3. The recording organisation should record the service information, as soon as possible but no later than four months after the animal has been served.

4. The sex and identity of the progeny should be recorded on the day of birth and notified to the responsible organisation no later than the first recording visit after their occurrence.

5. In the case of embryo transfer the records must show the genetic dam and the recipient dam as well as the service sire.

**Verification of Parentage**

The following checks must be carried out before a parentage record can be considered official.

a) That the served animal is properly identified.

b) That the service sire is properly identified.

c) That the Date of Birth is within ± 6% of the average gestation length for the recorded service date for the breed of service sire.

d) That the progeny of the served animal is properly identified.

e) That the service sire is verified either by an AI record or by evidence that the service sire was on farm on the day of service, or by a declaration by a Veterinary Surgeon (e.g. in the case of Embryo transfer).

**Supervision**

In addition the following supervisory checks may be carried out:

a) Blood typing or any other recognised method of checking genetic parentage.

b) Visual inspection of the progeny.
**Verification of Parentage:**

The following checks must be carried out before a parentage record can be considered official.

a) That the served animal is properly identified.

b) That the service sire is properly identified.

c) That the Date of Birth is within ± 6% of the average gestation length for the recorded service date for the breed of service sire.

d) That the progeny of the served animal is properly identified.

e) That the service sire is verified either by an AI record or by evidence that the service sire was on farm on the day of service, or by a declaration by a Veterinary Surgeon (e.g. in the case of Embryo transfer).

**Supervision:**

In addition the following supervisory checks may be carried out:-

a) Blood typing or any other recognised method of checking genetic parentage.

b) Visual inspection of the progeny.

**APPENDIX C: METHODS OF RECORDING PERFORMANCE**

1. The ICAR Agreement under Section 6 allows organisations a degree of freedom in deciding recording practices.

2. For each type of recording the predominant traits being recorded shall be used to determine the appropriate ICAR method classification.

   Method A.- All the recordings are undertaken by an official representative of the Recording Organisation. This includes recordings undertaken by approved on farm systems that are supervised by an official representative of the recording organisation and that cannot be manipulated by the farmer or his nominee.

   Method B.- All the recordings are undertaken by the farmer or his nominee.

   Method C.- The recordings are undertaken by the farmer or his nominee, and by an official representative of the Recording Organisation.

3. For official records an ICAR approved supervisory system must be maintained and check data regularly documented to provide authentication for the records.

4. ICAR Members must ensure that any of their associate recording organisations fully comply with ICAR approved recording methods and practices.

**APPENDIX D: INDIVIDUAL ANIMAL CERTIFICATES**

**Basic Principles**

1. An official certificate must contain all the information essential to establishing the identity and value of an animal.
2. An official certificate must clearly indicate the recording methods used to produce the official record.

3. An official certificate must contain the latest information available on the date of issue.

4. Where any estimated information is included in an official certificate, this must be clearly indicated.

The following details must be reported:

a) The ICAR member organisation issuing the certificate.
b) The date of issue of the Certificate.
c) The identity number and name of the animal.
d) The animal's "original number" and name, if different.
e) The name of the register in which the record is held.
f) The date of birth of the animal.
g) The identity and names of the animal's sire and dam and of its grand sires and grand dams.
h) The breed of the animal, or in the case of cross bred animals, the main breed percentages in the animal's breeding.
i) The sex of the animal.
j) The animal's genetic evaluations.
k) The animal's records of production.
l) The animal's type classification evaluations.
m) That the animal is a known carrier of a genetic defect, defined by the International Breed Federation concerned.
n) Any events which have significantly affected the animal's records e.g. Alpage, sickness and hormonal treatments.
o) The location of the animal on the date of the last recording.
p) The methodology used in the production of the record, where this is other than the Reference Method.

The following details may be reported:

a) The name and address of the breeder of the animal.
b) The date of the animal moved to the present location, if other than the date of birth.
c) The date of commencement and the end date for each period production record.
d) The events which started and ended each production period.
e) The individual recording day production records.
f) Any health event recorded for the animal.
g) The dates and service sire of any recorded services.
h) The identity and sex of any progeny of the animal.
i) If the animal has been flushed to produce ova, the flushing dates and the number of viable ova collected.
j) If the animal has been used as a recipient following ET, the date of transfer, the genetic sire and dam of the embryo and the sex of the embryo.
k) The fertility records of the animal, including its current fertility status.
l) Additional traits records and evaluations, such as milkability and locomotion scores.
m) That the animal is dead.
n) The number of true recording (no missing values) contained in the record for each production period.

**APPENDIX E: SUPERVISION OF RECORDING**

**Basic Principles**

1. For a record to have "official status", the ICAR approved scheme under which the recordings are made and calculated must be subjected to supervision by an ICAR member.

2. ICAR members are responsible for ensuring that there is sufficient supervision of members and associate member's records.

3. ICAR members and/or their nominees shall demonstrate that they have sufficient supervision of their own and of their associate records, by registering their supervisory practices with the ICAR Secretariat and by reporting on the checks carried out in the year.

**The following Supervisory Practices must be followed:**

a) That all recordings are carried out using ICAR approved methods and equipment.

b) That the recording equipment is properly installed, accurately calibrated and properly used.

c) That the animals being recorded are properly and clearly identified.

d) That there are routine checks in place to detect and identify information that is inconsistent and cannot be accurate.

e) That action is taken to deal with inconsistent and inaccurate information, either by replacing it with the correct information (missing values procedures) or by deleting information known to be inaccurate from the official record.

f) That where supervision is carried out by a person, the supervisor must not be the person who did the recording or calculation being supervised.

**The following practices are recommended:**

a) That quality control checks should be part of the normal recording working practices and systems, rather than occasional extra spot checks.

b) That the results of routine quality control checks should be reported to the recording organisations, users, to the regulators, and in the annual report of that organisation.

c) That an occasional check repeat recordings should be carried out on leading herds, flocks and individual animals, to maintain the reputation for accuracy, of the recording organisation and of ICAR member organisations.

**APPENDIX F: REGISTRATION OF RECORDING METHOD WITH ICAR**

**Duties of Member Organisations Operating or Approving Recording Services**

Each member organisation must inform ICAR which recording methods are being used in that country. ICAR must be informed, when the methods used in a country change. The description to the Committee of the methods of recording being used in a member country must include the following items:
Identification and Parentage
a) The method of recording the date of birth/breed and the sex of the animal.
b) The method of recording parentage.
c) The method used and description of method of supervision employed.
d) The frequency of recording.
e) The methods used for checking the accuracy of record collection.
f) The methods used for checking the accuracy of record processing.

Production (Milk)
a) The method of recording milk yield.
b) The frequency of recording.
c) Sample testing procedures.
d) The number of milkings at which yields and samples are collected if there is a difference between yield and sample recording numbers.
e) The methods used for checking the accuracy of records collection.
f) The methods used for checking the accuracy of records processing.
g) The methods used to calculate official lactation totals.
h) The accuracy of the recording method used, calculated in a manner determined by ICAR, expressed in relation to the standard method.

Production (Meat and Other Traits)
a) The method of recording.
b) The methods used for checking the accuracy of record collection.
c) The methods used for checking the accuracy of records processing.
d) The methods used to calculate official records.
e) The accuracy of the recording method used, calculated in a manner determined by the Committee.

SECTION 2.1

Appendix A: RECORDING INTERVALS

<table>
<thead>
<tr>
<th>Interval between(Weeks) of Recordings</th>
<th>Minimum Number Recordings per year</th>
<th>Interval between (days) of recordings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Min</td>
</tr>
<tr>
<td>1</td>
<td>44</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>22</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>4*</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
<td>38</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>44</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>9</td>
<td>5</td>
<td>55</td>
</tr>
<tr>
<td>Daily</td>
<td>310</td>
<td>1</td>
</tr>
</tbody>
</table>

* Reference Method
Seasonal Production and Dry Periods

Where a herd is dry for a period of the year, the minimum number of visits should be adjusted proportionately to the production period.

Guidelines - minimum number of herd recordings should be at least 85% of the normal number of recordings.

Appendix B: SYMBOLS USED ON RECORDS

Two Milkings per Recording Day is the Reference Method

Recording other than by the reference method must be indicated using the appropriate symbols.

<table>
<thead>
<tr>
<th>Number of Milking per day</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once per day Milking</td>
<td>1 x</td>
</tr>
<tr>
<td>Three Milkings</td>
<td>3 x</td>
</tr>
<tr>
<td>Four Milkings</td>
<td>4 x</td>
</tr>
<tr>
<td>Continuous Milking (e.g. robotic milking) Regular milkings not at the same times on each day (e.g. 10 milkings per week) Shown as the average number of milkings per day.</td>
<td>R x (e.g. 1.4 x)</td>
</tr>
<tr>
<td>Animals that are both milked and suckled. (Number of times milked to prefix the S)</td>
<td>S x</td>
</tr>
</tbody>
</table>

Recording Schemes where not all Milkings are Recorded

- 1. Where the herd is recorded at one milking at one recording visit and a different milking at the next recording visit, the symbol T should be used. (Alternative milking).
- 2. Where the herd is recorded at the same milking at each recording visit, the symbol C should be used. (Corrected milking).

Appendix C: 1. The Interpolation Method

The Interpolation Method is the reference method for calculating lactations.

The following formulae are used to compute the lactation record for milk yield (MY), for fat yield (FY), and for fat percent (FP).

\[
MY = I0M1 + I1*(M1+M2) + I2*(M2+M3) + \ldots + In-1*(Mn-1+Mn) + InMn
\]

\[
FY = I0F1 + I1*(F1+F2) + I2*(F2+F3) + \ldots + Fn-1*(Fn-1+Fn) + FnF2
\]

\[
FP = \frac{FY * 100}{MY}
\]

Where:

- M1, M2, Mn are the weights in kilograms, given to one decimal place, of the milk yielded in the 24 hours of the recording day.
F1, F2, Fn are the fat yields estimated by multiplying the milk yield and the fat percent (given to at least two decimal places) collected on the recording day.

I1, I2, In-1 are the intervals, in days, between recording dates.

I0 is the interval, in days, between the lactation period start date and the first recording date.

In is the interval, in days, between the last recording date and the end of the lactation period.

The formulae applied for fat yield and percentage must be applied for any other milk components such as protein and lactose.

Details of how to apply the formulae are shown in the annex to the Appendix.

2. The AM/PM Milkings and the T and C Methods

Test day milk yields (M1,.........Mn) and component percentages must be estimated using a procedure approved by ICAR. (Approved methods are shown in the Annex).

3. Other Methods

In order to be approved by ICAR, any new computational method must be fully documented by the requesting member organisation and must be applied to the data set of standard lactation curves and reach the minimum level of accuracy as defined by ICAR.

Provisional approvals can be issued by the ICAR Board.

Appendix C - Annex 1: CALCULATION EXAMPLES BY USING THE INTERPOLATION METHOD

<table>
<thead>
<tr>
<th>Calving: March 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning of lactation: March 26</td>
</tr>
<tr>
<td>End of lactation: January 3</td>
</tr>
<tr>
<td>Duration of lactation period: 284 days</td>
</tr>
<tr>
<td>Number of testings (weighings): 10</td>
</tr>
</tbody>
</table>
### Table 1. Computation by using the Test Interval Method

<table>
<thead>
<tr>
<th>Date of recording</th>
<th>Nº days</th>
<th>Daily Production (kg)</th>
<th>Butterfat (g/día)</th>
<th>Total Milk (kg)</th>
<th>Total Butterfat (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar 26</td>
<td>Apr 8</td>
<td>14</td>
<td>28.2</td>
<td>1029</td>
<td>395</td>
</tr>
<tr>
<td>Apr 9</td>
<td>May 6</td>
<td>28</td>
<td>(28.2+24.8)/2</td>
<td>(1029+856)/2</td>
<td>742</td>
</tr>
<tr>
<td>May 7</td>
<td>June 5</td>
<td>30</td>
<td>(24.8+26.6)/2</td>
<td>(856+904)/2</td>
<td>771</td>
</tr>
<tr>
<td>June 6</td>
<td>July 7</td>
<td>32</td>
<td>(26.6+23.2)/2</td>
<td>(904+824)/2</td>
<td>797</td>
</tr>
<tr>
<td>July 8</td>
<td>Aug 2</td>
<td>26</td>
<td>(23.2+20.2)/2</td>
<td>(824+778)/2</td>
<td>564</td>
</tr>
<tr>
<td>Aug 3</td>
<td>Aug 30</td>
<td>28</td>
<td>(20.2+17.8)/2</td>
<td>(778+721)/2</td>
<td>532</td>
</tr>
<tr>
<td>Aug 31</td>
<td>Sept 25</td>
<td>26</td>
<td>(17.8+13.2)/2</td>
<td>(721+587)/2</td>
<td>403</td>
</tr>
<tr>
<td>Sept 26</td>
<td>Oct 27</td>
<td>32</td>
<td>(13.2+9.6)/2</td>
<td>(587+446)/2</td>
<td>365</td>
</tr>
<tr>
<td>Oct 28</td>
<td>Nov 22</td>
<td>26</td>
<td>(9.6+5.8)/2</td>
<td>(446+287)/2</td>
<td>200</td>
</tr>
<tr>
<td>Nov 23</td>
<td>Dec 20</td>
<td>28</td>
<td>(5.8+4.4)/2</td>
<td>(287+231)/2</td>
<td>143</td>
</tr>
<tr>
<td>Dec 21</td>
<td>Jan 3</td>
<td>14</td>
<td>4.4</td>
<td>231</td>
<td>62</td>
</tr>
<tr>
<td><strong>Total quantity of milk:</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>4,973 kg</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total quantity of butterfat</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>190 kg</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Average butterfat percentage</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>190,216 x 100 = 3.82%</strong></td>
<td><strong>4,973</strong></td>
</tr>
</tbody>
</table>
2. Additional Approved Calculation Methods (Centering Date Method)

<table>
<thead>
<tr>
<th>Date of Recording</th>
<th>Quantity of milk (kg/d)</th>
<th>No of days per interval</th>
<th>Butterfat %</th>
<th>Total Milk (kg)</th>
<th>Total Butterfat (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 8</td>
<td>28.2</td>
<td>28</td>
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<td>790</td>
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<td>26.6</td>
<td>28</td>
<td>3.40</td>
<td>745</td>
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<tr>
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<td>23.2</td>
<td>28</td>
<td>3.55</td>
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<td>28</td>
<td>3.85</td>
<td>566</td>
<td>21.776</td>
</tr>
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<td>August 30</td>
<td>17.8</td>
<td>28</td>
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<td>October 27</td>
<td>9.6</td>
<td>28</td>
<td>4.65</td>
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<td>5.8</td>
<td>28</td>
<td>4.95</td>
<td>162</td>
<td>8.039</td>
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<tr>
<td>December 20</td>
<td>4.4</td>
<td>28</td>
<td>5.25</td>
<td>123</td>
<td>6.468</td>
</tr>
</tbody>
</table>

Total quantity of milk 4,866 kg
Total quantity of butterfat 187 kg

Average butterfat percentage: $\frac{187}{4,866} \times 100 = 3.83\%$

APPENDIX D: A LACTATION PERIOD IS CONSIDERED TO COMMENCE:

a) The day the animal gives birth.

or

b) In the absence of a birth date, the best estimate of day that the animal commenced milk production.

and

c) When a birth is defined as a parturition taking place after the mid point of the gestation period if a service has been recorded, or if no service event has been recorded taking place after at least 75% of the normal gestation period has elapsed since the previous birth event was recorded.

Any parturition falling outside the above definition shall be recorded as an `end pregnancy/ abortion and shall not start a new lactation period.

For cows of dairy breeds the normal gestation length shall be 280 days.

For goats and sheep, the normal gestation length shall be 150 days.

If the first recorded date falls within 4 days of the lactation start date, the milk yield and contents at the first recorded visit should not form part of the official lactation record.

A Lactation Period is considered to end:

1. The day that the lactation period as defined by the member or by ICAR has been completed or
The day that the animal ceases to give milk (goes dry) or
The animal is suckled in any recording day other than the first in the lactation period
or
The day the animal gives less than the minimum standard quantity of milk for the species (unless recorded sick/absent).
The minimum standard quantity is:-
a) Cows < 3 kg/day or < 1.0 kg/milking.
b) Goats/Sheep < 0.2 kg/day or 0.05 kg/milking.

2. When it is normal practice to record dry dates, in the absence of a date, the due to dry off date may be used, or the animal may be assumed to be dry the day after it was last recorded to be in milk or
When it is normal practice not to record the dry date, the day of the midpoint between the last recording with the cow in milk and the first recording day with the animal dry may be assumed to be the Dry Date.
The lactation period ends on which ever date of 1 or 2 above occurs first.
Animals may be recorded as absent or sick on recording days, without such an event ending the lactation period.

**Milking Period**
In the case of animals which are suckled for a significant period after the lactation period start date (e.g. some sheep) the lactation record should be expressed as a `milking period record.
The milking period (symbol MP) begins the day after the animal was last suckled and ends as defined for the lactation period.

**Production Period**
In the case where yield records are calculated on the basis of a `period of production, usually a year, the record should be expressed as a `production period record (symbol PP).
The production period beginning the day after the last production period ended and ending as defined by the length (in days) of the production period.

**Appendix E: MISSING RESULTS AND/OR ABNORMAL INTERVALS**

- 1. A 'daily test value is the best estimate of the yield and the components of the milk weighed, sampled and recorded in 24 hours on the day of recording.

When herds are normally milked at intervals such that the test day is other than 24 hours, the yields shall be adjusted to a 24 hour interval using the following procedure (or other procedures approved by the ICAR Board):
Divide 24 by the interval, then multiply by the yield. For example:

a) For a 25 hour interval \((24/25) \times 35 \text{ kg} = 33.6 \text{ kg}\)

b) For a 20 hour interval \((24/20) \times 35 \text{ kg} = 42 \text{ kg}\)

- 2. A 'recording is a set of daily test values for a given animal on a given day of recording, one or some or all of them can be missed (missing values).

- 3. 'Missing Values can be due to:
  - Vacation (once per year).
  - Out of range (see note 5).
  - Sickness, injury, animal under treatment or on heat (see note 6).
  - Disaster (reason must be reported).
  - No sample test results.

- 4. The number of the official and complete (milk, fat and protein) recordings in the lactation should be reported.

- 5.- Range of the daily test values.

<table>
<thead>
<tr>
<th></th>
<th>Milk yield (kg)</th>
<th>Fat (%)</th>
<th>Protein (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>Main Dairy Cattle Breeds</td>
<td>3.0</td>
<td>99.9</td>
<td>1.5</td>
</tr>
<tr>
<td>High Fat Cattle Breeds</td>
<td>*3.0</td>
<td>99.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Goats</td>
<td>0.3</td>
<td>30.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Sheep</td>
<td>0.3</td>
<td>30.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

* Breed average higher than 5.0 for fat %.

Outside of these ranges, the daily test value will be considered as a 'missing value.

- 6. The true daily test values collected from animals labelled by the farmer as sick, injured, under treatment, or 'on heat must be used in the computation of the lactation record unless the milk yield is less than 50% of the previous milk yield or less than 60% of the predicted yield. In such a case, the whole set of daily test values may be considered as missing.

- 7. Estimates of the missing values of a daily test can be computed by using interpolation procedures or by more sophisticated procedures approved by ICAR.

- 8. For any ICAR method the interval between two consecutive recordings must routinely fulfill the value for the acceptable range. This rule does not apply to the recordings at the beginning and at the end of the lactation.

- 9. If the first recording occurs within 14 days from calving, then no adjustment is required to the first test value when computing the lactation
record. If the first recording occurs 15 to 80 days from calving, then an
adjustment procedure may be applied.

- 10. If the 305th day of a lactation falls before the last recording, the
  interpolation method should be used also for the last period to compute the
  yields.

SECTION 2.2.

Appendix A: INTERNATIONAL REGULATIONS FOR RECORDING IN SHEEP

I. The definition of milk traits:
The following terms will be used to describe all possible livestock breeding
systems:

the suckling length corresponds to the suckling period of lambs or the
simultaneous suckling and milking period. If the lambs only suckle during the
colostral phase, the suckling length is considered to be zero. If there is an initial
suckling phase, milk yield during this suckling period is equal either to the milk
suckled if suckling only, or to the milk suckled plus that milked should there be
partial milking during the suckling period.

the milking-only length corresponds to the period during which the ewe is
milked once the lamb(s) has(have) been weaned and until drying off.

the lactation length is equal to the sum of the suckling length plus milking-only
length: it is also the difference in days between the date of lambing and the date
of drying off.

Total milk yield per lactation is the sum of the milk yield of the suckling period
(milk suckled, or milk suckled plus that milked) plus the milk yield during the
milking-only period. Only the milk yield during exclusive milking can be
measured simply and accurately as part of milk recording on farms. If the
suckling period is not of zero length, the milk yield in dairy sheep only takes into
account exclusive milking and the length of the milking-only period (which starts
once the lambs are fully weaned and finishes when the ewe dries off).

The following situations therefore arise:

1) Milking from lambing
The ewes are milked after lambing (once the colostral phase is over) as is
usually the case with dairy cattle.

The lactation length and the length of the milking-only period are thus equal (not
counting the colostral phase). Milk yield during exclusive milking equals the total
milk yield during lactation.

2) Milking after a suckling period
The ewes are milked after a suckling period for the lambs or after a combined
suckling plus milking period.
Milk yield during the milking-only period is therefore somewhat less than total milk yield during lactation: only the downward phase of the lactation curve is recorded in almost all cases, and the lactation peak falls within the initial suckling (or suckling plus partial milking) period. The length of the milking-only period equals the lactation length minus the suckling length.

**Through the incorrect use of language, we often speak broadly of lactation calculations, whereas here it is strictly used for the milk yield calculation using the milking only period.**

3) **Total milk yield and production of reference**

Either the total milk yield per lactation or the milk yield during milking-only period is calculated, according to whether mechanical/by hand milking starts from lambing or whether it starts after a suckling period. Because the breeding systems may differ very much from area (breed) to area (breed), it is impossible to define a standard lactation length or a standard milking length (of the milking-only period): We therefore recommend that the approved organization define, for each breed and category of ewes (age or lactation number), a reference production per lactation or a reference production for the milking-only period, according to the breeding system. The chosen standard length (in days) must be declared with the publication of the results.

II. **Obligatory rules and standards**

This chapter describes all the obligatory rules and standards applicable in all cases for official method A or B milk recording.

1) **Responsibility and type of recording**

The various recording operations described below are carried out by a State employee or an employee of an organization officially registered with the State (the milk recording itself being undertaken by an official tester of the organization in the method A, and by the farmer or his employee in the method B):

**identification of animals** by tattooing (or by other forms of marking or electronic identification which are considered secure) on the basis of a national system providing a single number for the animals within or between flocks.

**recording of information** on mating and artificial insemination (in the case of recorded mating), and lambing, milk recording (ewe and flock), keeping of ewe and ram inventories on the flocks of owner-breeders.

**checking of the records and periodic visits of the sheep farms**: organisation of controlled mating (optional), keeping of lambing records, marking of lambs at birth, checking on maternal/paternal filiations based on the average length of gestation and its standard deviation (i.e. an average gestation period of \( x \) days plus or minus \( y \) days). The values of \( x \) and \( y \) must be provided for each breed or group of breeds concerned in each country.

Whatever the method A or B used for milk recording, certain information is provided by the breeder himself, such as mating and lambing information (in the case of controlled mating): they are subject to a *supervisory system which must be effected by the relevant Government Authority or by an organization*
recognized by it: for instance, in this case it may be a check on pedigree by blood group. Generally speaking, any information produced directly by the breeders (rather than an official recorder) must be subject to the supervisory procedure described by the organization officially recognized by the State.

2) Ewes to be controlled

The breeder may split his sheep-breeding into one or several flocks. If the breeder is managing several flocks, he may record only one of his flocks, on condition that he agrees to breed the recorded flock, always separately, from his other non-recorded flock(s) which can be considered as commercial flocks. Likewise, if only one of the flocks of the breeder is recorded, it is forbidden to mix ewes of a non-recorded flock with the ewes of the recorded flock, during the milk period.

An inventory of those ewes on the recorded flock(s) which belong to the breeder in question is kept throughout the milk recording operation from the beginning to the end of milking.

Whenever there is (quantitative) milk recording for the recorded flock, all the ewes being exclusively milked (of the breeds or genotypes involved in the breeding program) must be recorded: the principle of an exclusive record is essential to avoid sampling biases. Ewes suckling or suckling with partial milking during the suckling phase (cf chapter 1) must not be included: it is impossible to measure the individual milk yield of suckling ewes or suckling plus milked ewes simply and accurately (conditions essential for the large-scale application of milk recording on farms). Consequently, only milk recording carried out when the ewe is definitively separated from its lamb(s), i.e. only when being milked exclusively (cf chapter 1) must be taken into account.

Likewise, if dairy ewes belonging to another farmer are being kept for part of the year at the farm where milk is being officially recorded, they are not to be included in the recording for that farm. This is why it is essential that all ewes belonging to a breeder who applies Method A or B milk recording to his flock(s) must be included in an up-to-date and accurate inventory.

3) First test-day

3.1) For the flock

The first test-day of the flock takes place 4 to 15 days after the beginning of mechanical/by hand milking only in the flock. This recommendation is suitable for the practical organisation of tests on the basis of a monthly recording interval.

3.2) For a ewe

The first milk recording of an ewe must take place within the 35 days following complete separation from its lambs, with a tolerance of 17 days to take into account the starting of milking only by batch and fluctuations in the periodicity of milk recorders’ visits. Consequently, the difference between lambing and the first (quantitative) milk recording of a ewe is at most equal to the average suckling length of the breed in question plus 52 days (35 + 17). If this difference is greater than the threshold described above, there should be
no lactation calculation for the ewe in question. For example, for breeds whose average suckling period lasts 0 days (colostral phase only), 25 days or 45 days, the first quantitative milk recording of each ewe must take place less than 52, 77 or 97 days respectively after lambing.

4) Frequency and number of milk recording visits

4.1) For the flock

In the case of record of the two daily milkings, the average recording interval (days) between two successive milk recording for a flock is monthly (30 days, with a range from 28 to 34 days) for A4 or B4 method, and it can reach respectively 36 and 42 days for A5 or B5, and A6 or B6 method. If only one daily milking is recorded (AT or AC method), the average recording interval is monthly (30 days), as for the A4 method (considered as the standard method). There is no minimum interval, so supplementary testing can be carried out when necessary due to the way the lambing is spread out (e.g.: a fortnight to three weeks between two successive tests so as to cover the start of milking of ewe lambs with respect to the interval between the adult ewe tests).

There is no set total number of monthly recording per flock and per milk period: it must therefore be decided upon by each official organization, as must clauses on the maximum interval (in days) between the first and last (quantitative) milk tests on the flock within a milking operation.

4.2) For a ewe

The maximum interval between two successive non-zero tests on the same ewe is 70 days (2 x 35 days). There is thus a tolerance of one missed test on the basis of a monthly test. If the interval between two tests (i) and (i+1) is greater than the maximum, the lactation calculation for the ewe being tested (i) is stopped.

The minimum number of valid monthly tests (milk not zero) per ewe needed for the lactation calculation is not set: it must therefore be described for each breed and category of ewe considered (first lactation, second and more).

5) Type and expression of milk recording

The only obligatory milk recording is that of the quantity of milk (i.e. quantitative recording). Tests on the chemical composition of the milk or qualitative tests are optional (cf chapter III). Quantitative recording concerns the quantity of milk supplied by the ewe when milked in the usual conditions on the farm, whether milked by hand or by machine. Should milking be mechanical, it is recommended not to take into account the volume of individual milk collected during hand or machine stripping in order to favour indirect selection as regards ability to machine milking.

If nethertheless the (hand or machine) stripping yield is recorded, it is necessary to mention it in the presentation of the results.

Milk is measured at the two daily milkings (method A4 or B4, method A5 or B5, method A6 or B6 ). However, this measurement may only be applied at one of the two daily milkings: in this case, either the strict alternating monthly
test is applied (method AT) or the corrected monthly test for evening/morning differences, taking into account the total volume of milk produced by the whole flock over the two milkings concerned (method AC).

**Milk may be measured by weight** (grammes) or **volume** (millilitres). It is acceptable to take volumetric measurements as they are usually quicker and can be as accurate as weighing (if milk meter measurements are independent of froth). The conversion factor of weight (grammes) into volume (millilitres) is 1.036 (normal sheep milk density). The minimum daily quantity tested is set at 200 g or 200 ml. The limit of error (standard deviation of error) is 40 g or 40 ml.

ICAR approval for dairy sheep equipment is not yet available. In the meantime milk should be weighted or measured by means of an instrument approved by the organization using it, and, if possible, checked by an appropriate government agency.

6) **Lactation calculation clauses**

6.1) **For the flock**

A farmer must adopt a single test method for a given milk period: method A (A4 or A5 or A6), method B (B4 or B5 or B6), method AT or method AC.

6.2) **For a ewe**

When milked from lambing, total milk yield per lactation is calculated using the **Fleischmann method** (or another method if proved to be of equivalent accuracy). When milked only after a suckling period, milk yield during exclusive milking is also calculated using the **Fleischmann method** (or another method if proved to be of equivalent accuracy), basic measurements only concerning the yield from milking after the lambs have been fully weaned.

Calculations may be based on the real weaning and drying off dates. They may also be based on dates calculated on the basis of standard lengths for the suckling period and the interval between the last non-zero milk recording and drying off. The **whole calculation procedure is defined by each country and/or breed, in which case it is necessary for the calculation clauses to be accurately described when the results are presented** (see chapter IV).

**Milking from lambing**

The total milk yield per lactation is calculated (as for cattle), together with the corresponding lactation length [difference between the drying off date and the lambing date]. The lambing date is the real date. The drying off date is either real or calculated. There may or may not be a minimum number of tests per ewe before applying the Fleischmann method of calculation. The calculation procedure is described by the organization responsible for its implementation.

**Milking after a suckling period**

The milk yield during the milking-only period and the corresponding length of the milking period [difference between the drying off date and the weaning date] are both calculated. The lambing date is the real date. The weaning date is either real or calculated (standard suckling length). The drying off date is also either real or calculated. There may or may not be a minimum number of tests
per ewe before applying the Fleischmann method of calculation. The calculation procedure is described by the organization responsible for its implementation.

**III Optional dispositions**

This chapter describes the optional records which can be kept within the framework of official method A or B recording.

1) Qualitative tests or tests on the milk's chemical composition

Given that it is costly and often technically difficult to administer in large flocks, testing the milk's chemical composition (which entails taking representative samples in order to analyse fat and protein content) is optional.

Such a qualitative test may be implemented either for experimental purposes or within the framework of integrated selection schemes which are already very efficient as regards milk quantity on the scale of the population in question. In the second case, the qualitative test must be part of the flock's monthly quantitative recording (A4 or B4, AC, AT) or approximatively monthly quantitative recording (A5 or B5, A6 or B6), whether carried out each month or only certain months. Furthermore, an attempt should be made to sample all or most ewes in one or more categories or classes of age found to be present during the corresponding quantitative tests in order to avoid sampling bias.

The qualitative test procedure is described by each officially recognised organization: objectives of the qualitative test (experimental or for selection purposes), frequency of testing, sampling procedure, categories of ewes sampled and percentage with respect to those ewes whose milk quantity is recorded, supervisory procedures followed (for the samples taken and milk analysis laboratories), type of chemical analysis and calculations made.

Analysis for protein content (or nitrogen content) and fat content must be carried out on the same sample representative of the recorded milkings. The equipment used for determining fat and protein content should undergo periodic checking in accordance with suitable standards, approved by ICAR.

2) Other types of testing

Other possibilities following on from the qualitative milking recording include somatic cell count and similarly, for other milk characteristics, the possibility of measuring machine milking ability via milk flows which can be recorded using automated sheep milk recording systems.

Even before milk recording, reproductive traits could also be recorded; this includes information on the reproduction method (artificial insemination following induced oestrus, induced oestrus and hand mating, natural mating etc.), the number and sex of lambs born etc.

Generally speaking, the procedures for such optional measurements are described by the officially recognised organizations responsible for their implementation.

IV) Presentation of results

This chapter describes firstly the way that obligatory milk recording results should be presented in compliance with the rules and standards laid down in
Chapter two. We then envisage the presentation of optional results on the basis of the options presented in the third chapter.

To facilitate the presentation, the following vocabulary is used for total milk yield calculations: total milked yield and milking length.

Total milked yield equals:
- total milk yield per lactation
- in the case of milking from lambing
- or milk yield during the milking-only period
- in the case of milking after a suckling period

**milking length equals:**
- lactation length
- in the case of milking from lambing
- or length of the milking-only period
- in the case of milking after a suckling period

1) **Obligatory results**

It is obligatory to provide the following results for a given breed and a given year or milk period:

1.1) Information on the milk recording and calculation methods
- organizations responsible for the milk recording
- method of quantitative recording used: method A4 or B4, A5 or B5, A6 or B6, AT or AC
- unit of measurement used for milk quantity: liters or kilos
- type of milk recording equipment (milk meter...) used: to be described
- organization responsible for the lactation calculation.
- drying off date: real or calculated; specify the procedure if calculated or describe whatever rule is applied to determine the end of the milking period
- date that lambs were weaned (should there have been a suckling period): real or calculated; indicate the average length of suckling used should this date be calculated
- minimum number of milk recording tests per ewe to calculate total milk yield
- calculation of total milk yield: based on the real length of milking or a standard length to be described
- published milking length: provide the calculation formula \[\text{difference between dates used}\]
- existence of adjustments for milk yield or not: type and description (example of adjustments for age, lambing period etc.)
- existence of supervisory systems or not: type and description.
1.2) Information on the flocks subject to official method A or B milk recording
number of farms subject to official milk recording (year)
number of ewes on these farms (inventory at lambing)
number of lactating ewes on these farms (calculated milk yield)
what system is used as regards lactation?
- system 1: milking from lambing
- system 2: milking after a suckling period
  if system 2: average length of the suckling period (in days) and detailed
description of the initial suckling or suckling plus milking phase
description of reproduction objectives: achievement of one or more lambings
  per milking period; age at first lambing.
type of milking: machine (% of farms and ewes subject to official recording) or
  by hand (% of farms and ewes subject to official recording)
results of milk recording: total milked yield and length of milking (cf box above);
average daily milk yield (total milked yield divided by the milking length). If
  possible, the milk yield results should be presented for all lactations and
  according to lactation number. Furthermore, raw milk results should be provided
  with no adjustment for factors of variations.

1.3) Information on the ewes
The following information must be provided for each lactation whose obligatory
results are published:
- the ewe's number
- age at lambing
- lactation number or category of age (to be described)
in the case of suckling, the real or standard suckling length
total milked yield (without adjustment)
milking length
average daily milk yield

It is possible to publish also the followed other results:
difference (in days) between the lambing date and the date of the first test day
maximum milk recording test (with the lactation stage)
total number of monthly milk tests realized for this ewe.
a production of reference (and the chosen standard length)

2) Optional results
2.1) Information on the implementation of qualitative milk recording
objectives of the qualitative testing: experimentation or selection
description of the sampling procedure used
test methodology used: milkings tested, test frequency, categories of ewes sampled
results: percentage of ewes sampled in relation to the ewes tested for milk quantity (for the same category of females)
analyses: type of milk analyses, methods and units of measurement used for results
calculations made: description of the type of calculations and results published
presentation of mean results - breed, flock and ewe
eexistence of supervisory systems or no: type and description.

2.2) Reproduction results
general description of breeding system distinguishing 2 main systems: one lambing per year or aiming to have several lambings per year
description of reproduction methods used (and their frequency for farms subject to milk recording): induced oestrus and artificial insemination, induced oestrus and hand mating, natural mating
results of average age at first lambing depending on the reproduction method
description of lambing periods (frequency) per age group and reproduction method
average fertility results per age group and reproduction method
average prolificity results per age group and reproduction method.

2.3) Other optional results
These results can be provided for the breed, flock or ewe. The following information is an example of such optional results:
results of weighing lambs at birth or on weaning
results of weighing ewes at parturition or lambing
causes for reform in the framework of milk recording
frequency of mastitis etc.

Conclusion
In order to be easily adaptable to the variety of dairy sheep breeding systems, the present international regulations for Method A or B milk recording in dairy sheep is both standard setting and informative: normative as concerns the constraints to be observed in the aim of guaranteeing simple and accurate measurements on farms; users can make objective comparisons as between countries and/or breeds of dairy sheep.
Appendix A - Annex 1 THE RULES AND STANDARD OBLIGATORY IN ALL SITUATIONS

1. Ewes to be controlled:
Whenever there is (quantitative) milk recording for the recorded flock, all the ewes being exclusively milked (of the breeds or genotypes involved in the breeding program) must be recorded, i.e. milk recording is realized only when the ewe is definitively separated from its lamb(s).

2. Type and expression of milk recording:
- The only obligatory milk recording is that of the quantity of milk (i.e. quantitative milk recording). That is to say that tests on the composition of the milk (or qualitative tests for fat and protein content) are optional.
- Milk may be measured by weight (grammes) or volume (milliliters). The conversion factor of weight (grammes) into volume (milliliters) is 1.036, which corresponds to the normal sheep milk density.
- The minimum daily milk yield tested is set at 200 g or 200 ml.
- The limit of error (standard deviation of error) is 40 g or 40 ml.

3. Frequency of milk recording visits:

<table>
<thead>
<tr>
<th>Monthly Method</th>
<th>Recording Length (Hours)</th>
<th>Recording Average (Daily) (+ or - 10%)</th>
<th>Symbol</th>
</tr>
</thead>
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<tr>
<td></td>
<td>24</td>
<td>30 ± 4</td>
<td>A/B</td>
</tr>
<tr>
<td>Others</td>
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<td>5</td>
<td>A/B</td>
</tr>
<tr>
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<td>6</td>
<td>A/B</td>
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<tr>
<td>Alternate Milkings</td>
<td>24</td>
<td>30</td>
<td>AT A</td>
</tr>
<tr>
<td>Corrected Milkings</td>
<td>24</td>
<td>30</td>
<td>AC A</td>
</tr>
</tbody>
</table>

**NB1:**
AT alternating monthly test (recording of only one of the two daily milkings)
A corrected monthly test for evening/morning differences (recording of only one of the two daily milkings) taking into account the total volume of milk produced by the whole flock over the two milkings concerned (bulk tank weights).

**NB2:**
No set total number of recording visits per year (described by each official organization).
Appendix A - Annex 2. LACTATION CALCULATION CLAUSES IF MILKING FROM LAMBING

TOTAL MILK YIELD

We recommend the approved organizations to define, for each breed and category of ewes (age or lactation number), a production of reference per lactation, with a standard lactation length close to the average lactation length of the considered breed (according to its breeding system).

Appendix A - Annex 3. LACTATION CALCULATION CLAUSES IF MILKING AFTER A SUCKLING PERIOD

MILK YIELD DURING THE MILKING-ONLY PERIOD

We recommend the approved organizations to define, for each breed and category of ewes (age or lactation number), a production of reference at milking-period only with both a standard suckling length and a standard milking-only length, close to the average suckling length and milking-only length of the considered breed (according to its breeding system).

Appendix B: INTERNATIONAL REGULATIONS FOR MILK RECORDING IN GOATS

The purpose of the present regulations is to provide results which can be applied for integrated selection schemes and for international exchange of animals and information.

1. Organization of milk recording:

Full liberty of action is allowed to the manner in which milk recording is organized in the different countries, provided that the local associations are approved by the national organizations.

Official or semi official supervision, however, is essential. This supervision must be effected by the relevant Government Authority or by an organization recognised by it.

The different recording operations are the following:

Identification of animals by tattooing (or by other forms of marking which are considered secure).

Carrying out of the recording.

Checking of the records and periodical inspection of the breeding farms.

Organization of the controlled mating, use of a kidding book.

2. Identification of the mates:

The identification of the kids must be done within a maximum of 30 days from birth. It is only necessary to tattoo or mark those kids which are kept for breeding purposes.
3. Type of goats to be controlled:
All goats milked on the day of milk recording, must be controlled.

4. Milk recording operations:

4.1 Lactation of Reference
It is not possible to standardize the lactations, because the breeding systems and the breeds themselves may differ from area to area. However, the minimum lactation should be at least 150 days with a maximum of 240 days.
The lactation length chosen must be declared by the organization.

4.2 Recording interval
Regarding the interval, it is not possible to define a standard interval.
The interval chosen must be established by the Organization and can be executed through different modalities according to the conditions of each country of the Organization.

4.3 Milk Recording Operations
Milk recording can be carried out in different ways according to the conditions in the countries of member organizations.

- 4.3.1 By an official recorder (Method A)
  At present the following possibilities are known and indicated:

<table>
<thead>
<tr>
<th>Recording length hours</th>
<th>Average recording interval (days)</th>
<th>Number of recordings per year</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>14</td>
<td>26</td>
<td>A2</td>
</tr>
<tr>
<td>24</td>
<td>21</td>
<td>17</td>
<td>A3</td>
</tr>
<tr>
<td>24</td>
<td>28-34</td>
<td>11-13</td>
<td>A4</td>
</tr>
<tr>
<td>24</td>
<td>36</td>
<td>10</td>
<td>A5</td>
</tr>
<tr>
<td>24</td>
<td>42</td>
<td>8-9</td>
<td>A6</td>
</tr>
</tbody>
</table>

Alternating recording in the morning and in the evening: 30 12 AT
Method A4 is considered as the standard.

- 4.3.2 By the owner of the goats or by an official recorder collaborating with the owner (Method B).

<table>
<thead>
<tr>
<th>Recording length hours</th>
<th>Average recording interval days</th>
<th>Number of recordings per year</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>30</td>
<td>12</td>
<td>B</td>
</tr>
</tbody>
</table>

- 4.3.3 The Presidential Board will decide on the symbols of other methods.
- 4.3.4 In the case of annual holidays, the recording may be suspended for a period not exceeding 75 days for individual goats and/or for the whole herd due. In case of veterinary restrictions for the area, the recording may be suspended up to 100 days.
4.4 Date of first Milk Recording
In the absence of suckling, the recording must not start before the 10th day from kidding.

In the case of suckling, the recording must start (subject to the conditions given in the preceding paragraph), after the 40th day from kidding. With regard to calculations of milk production, ignore the suckling and estimate production from the 40th day after kidding.

4.5 Minimum Number of Recordings
At Least 3 recordings are necessary to estimate a lactation.

4.6 End of lactation
To estimate the milk production for the period from the last recording to the drying off, it is necessary to multiply the yield by a number of days equal to half the interval period chosen.

5. Publication of results:
The production may be expressed in kg or in ml. Milk quantities may be measured by the use of any instrument with a precision of 20 g or ml.

The milk quantity produced in the strippings must not be included.

Determination of fat content or protein content (or nitrogen matter) is optional.

6. Establishing weight of milk and content of fat and protein:

6.1 The milk should be weighed or measured by means of an instrument approved by the member organization and, if possible, checked by an appropriate government agency of the country concerned.

As far as milk meters and parlour jars are concerned, the specifications and instructions approved by the Committee from time to time should be followed.

6.2 Methods approved by the Committee for estimating the fat and protein (or nitrogen matter) contained should be employed.

The equipments and materials used for analyses should be prepared or checked by the technical services of the same organization.

6.3 Analysis for protein content (or nitrogen content) and fat content must be carried out on the same milk sample.

The samples should be taken after the milk produced by a single goat has been properly mixed. A 24 hour composite milk sample is required for analysis.

If a preservative is used it should not influence the results of the sample analysis.

6.4 The equipment used for determining fat and protein content should undergo periodic checking in accordance with suitable standards.

Every member organization is required to inform the Committee of these standards.
7. Calculation methods:

7.1 The total quantity of milk and the percentage of butterfat and/or protein is to be calculated by one of the following two methods (or by another method if proved to be of equivalent accuracy). Methods incorporating the centring principle are to be preferred, i.e. centring the results for any test day on a period for which the test day is the mid point or alternatively, by applying the average of results at the beginning and the end of a period (see Method n° 2).

- 7.1.1 Method N° 1

For each interval between two successive testings a separate calculation is made of the quantity of milk produced by multiplying the results of the weighing of the test day by the number of days in the interval leading up to it.

The addition of these interval yields gives the total milk produced for the entire lactation period.

The quantity of fat and protein contained in the milk is obtained in the same way.

The average percentage of fat and protein contained in the milk is obtained by multiplying the total quantity of fat and protein (in whole kg s) by 100 and dividing these totals by the total quantity of milk (in whole kg s).

- 7.1.2 Method N° 2

For each interval between two successive testings a separate calculation is made by adding the results of the weighings of the two test days, and dividing by two.

The quotient is then multiplied by the number of days between the two test days.

The lactation yield of milk is obtained by totalling the milk yield calculated for all the intervals.

The quantity of fat and protein contained in the milk is obtained in the same way.

The average percentage of fat and protein contained in the milk is obtained as indicated for Method N° 1.

7.2 If recording is suspended for a period not exceeding 100 days, the missing figure or figures can be estimated by taking average of the preceding and subsequent testing, or by another suitable method.

SECTION 3. APPENDIX A: BEEF PERFORMANCE RECORDING

1. Scope:

The recommendations deal only with beef performance recording, not with genetic evaluations; they are minimum requirements, not recommendations, which allow a harmonised beef performance recording preliminary to any comparison of breeding values.
The recommendations are independent from production systems (i.e. finishing herds or suckler herds) or from breed orientations (i.e. dairy breed or beef breed).

They apply to beef performance record, not to performance recording systems which may include several performance recordings (i.e. in addition to beef performance, reproduction traits or morphology linear scoring).

These recommendations provide a framework which may be used at least for genetic evaluations and possibly for other purposes:

- farm reports;
- statistical summaries

2. Recording Schemes:

As for milk production (which may be measured at different stages of lactation), beef production may be measured at different stages of development of the animals, in a range of different circumstances.

Genetic evaluations for beef traits may take account of beef trait performances either singly or in combination.

*Recommendations are made for the following cases:*

- suckler herds from birth to weaning,
- test stations,
- finishing herds after weaning to slaughter,
- official at sales,
- in abattoirs.

As genetic evaluations require performance records, the recommendations give the minimum requirements for performance recording.

3. Symbols:

In order to facilitate communication, a three letter symbol is given to records which fully comply with the recommendations.

The first letter gives the method of recording "A", "B" or "C" (see section 1, appendix C), the others being the symbol for the recommendation. For instance, the symbol for beef performance recording in suckler herds from birth to weaning when the weights are taken by technicians is `A/SH ; `A for the method and `SH for the relevant recommendation.

4. Definitions:

For the purpose of these recommendations the following definitions apply:

- **performance**: heritable measure or observation concerning an animal in relation to the economic result of a production system;
- **beef performance**: performance in relation to the quantity and the quality of saleable lean meat;
- **weights**: measure in kilograms obtained from weighing scale checked for accuracy:
reference performance: expression for a performance to be used, in addition to other locally approved expressions, in order to compare phenotypic values or for data exchange between different performance recording schemes;

herd: group of animals kept for the same purpose at the same location

5. Common rules to all the recommendations:

Beef performance recording requires an identification and registration system for new born calves which includes at least:-

- animal identification,
- birth date,
- breed,
- calving parity,
- sex,
- parent information,
- type of calf (single, multiple or embryo transfer),
- farm identification where calf is born.

6. References to the International Agreement of Recording Practices:

The following rules of the International Agreement of Recording Practices fully apply to the recommendations for beef performance recording:

- recording: basic principles;
- organisation of recording;
- recorded herds.

RECOMMENDATIONS FOR TEST STATIONS

1. Introduction

The main objective is to estimate the breeding value of potential sires by removing all possible sources of non genetic variation.

Until recently the most that performance recording could offer, was comparison within a test group.

The Animal Model using the relationships between the recorded bulls allows comparisons when there are enough genetic connections between animals from different stations.

The more the conditions of individual performance tests are similar to those under which the progeny will be reared, the more the tests are efficient in terms of expected improvement. Individual performance test procedures should be designed to meet the requirements of specific production systems.

The length of test, the age of the animal at the end of the test, as well as the regime in terms of energy level is a comprise, taking account of the breeding requirements, the age of progeny at slaughtering, the use of the stations and the conditions under which those bull’s progeny will be reared.

Consequently a lot of different procedures may meet the requirements of the recommendation.
2. Field of Application

This recommendation applies to individual performance test stations where the objective is to assess genetic difference mainly from the individual performance of bulls from several herds assembled in a single location and raised under uniform and standardised conditions.

Tested bulls may be from dairy, dual purpose or beef specialised breeds. They may be AI or by natural service sires.

It does not apply neither to progeny test stations, nor to experimental stations.

3. Description

Performance recording which meets the following requirements fully complies with the recommendation for beef performance recording in test stations.

a) Symbol

The symbol of the recommendation is `PT`.

b) Method of Recording

Only "A" method should be used. Recording must be carried out by an official recording organisation.

c) Recorded Animals

Records must to be obtained for all the bulls entering the stations. The bulls should be from several herds. The herds must participate, in an ICAR official performance recording scheme which may be milk recording or any other official performance recording scheme, namely in suckler herds.

d) Test Procedure Description

The test procedure should be precisely documented and published.

e) Management of the Test

The bulls should enter the stations as soon as possible.

The test consists of two separate periods: the pre test period and the test period.

The length of the pre test period which is necessary to limit the importance of compensatory growth is at least four weeks.

The length of the test period is at least four months (120 days).

The maximum difference in age should not exceed three months (90 days) at the beginning of the test period.

f) Mandatory records

For each of the recorded animals the following data should be recorded:-

- Animal identification.
- Date of weighing at the start of the test period.
- Live weight at the start of the test period.
- Date of weighing at the end of the test period.
• Live weight at the end of test period.
• Live weights must be the average of at least two weights taken on successive days.

g) Recommended records
Each recording organisation may decide to record additional information. In that case the records must be obtained for each of the recorded animals.

In line with future ICAR recommendations for morphology records, linear scoring both for muscular and skeletal development as well as for functional capacity may be recorded.

h) Reference performance
The reference performance record is the average daily gain.

The calculation method is:-
let AS be the age at start in days,
let AF be the age at finish in days,
let SW be the live weight at start,
let FW be the live weight at finish,
the average daily gain is equal to, \((FW - SW)* 1000 / (AF - AS)\).

2. SUCKLER HERDS FROM BIRTH TO WEANING:

1. Introduction
The recommendation does not deal with a complete performance recording system for suckler herds. Recording systems cover a wide range of traits, from the low heritability traits related to reproduction (i.e. calving ease) to mid heritability traits related with growth (i.e. weaning weight) up to high heritability traits related to conformation(i.e. muscularity).

2. Field of Application
This recommendation applies to in field beef performance recording undertaken in herds of cows which suckle their calves until an age of at least four months.

Data is collected in order to provide farmers with information useful for herd management and to provide, raw data for genetic evaluations.

This recommendation may also apply to progeny test stations.

It allows for genetic evaluation both for growth ability and milking ability.

3. Description
The performance recording which meets the following requirements fully complies with the recommendation for beef performance recording in suckler herds from birth to weaning.
a) Symbol
The symbol of the recommendation is `SH`.

b) Method of Recording
The methods "A", "B" and "C" can be used.

c) Recorded Animals
Records have to be obtained for all the animals from the same group of dam/calf kept at the same location for the same purpose.

d) Mandatory records
For each of the animals the following data should be recorded:-

- Animal identification,
- Weighing date,
- One weight taken at an age between 90 and 250 days,
- Farm identification,
- Abnormal records in relation to preferential supplies of concentrates,
- Identification of the management group within herd when they exist,
- Identification of fostered calves.

e) Reference performance
The reference performance is the weight adjusted for an age of 200 days.
The calculation method is:-
let AW be the age at weighing in days,
let WG be the weight in kilograms,
let BW be the actual birth weight or a breed standard,
the reference performance is equal to, \((W - BW) \times 1000) / AW \times (200 - AW) + WG.\)

3. ABATOIRS:

1. Introduction
Commercial slaughter results are recorded routinely by abattoirs to meet the requirements of different regulations.
This information is obtained routinely for commercial use.
Though this data was not field performance it may be considered as beef performance recording.

2 Field of Application
This recommendation fits any type of cattle slaughtered before an age of thirty six months.
Data is collected in order to provide farmers with information useful for herd management and to provide raw data for genetic evaluations. The animals may be calves, young bulls, steers and heifers. They may be from crossing between specialised milk breeds and specialised beef breeds, or from dairy breeds or from beef breeds. This recommendation may also apply to progeny test stations. It requires abattoirs and farmers to use the same animal identification.

3 Description
The performance recording which meets the following requirements fully complies with the recommendation for beef performance recording in abattoirs.

a) Symbol
The symbol of this recommendation is `AB .

b) Method of recording
There is only a Method A. Carcasses have to be weighed and graded according to an official system.

c) Recorded animals
Records must be obtained for all the animals slaughtered from the same group of animals kept for the same purpose at the same location.

d) Mandatory records
For each of the recorded animals the following data should be recorded:-
- Animal Date of Birth,
- Animal identification,
- Abattoir identification,
- Slaughter date,
- Commercial official slaughter weight of carcass,
- Finishing farm coding.

ej) Mandatory records from animals slaughtered in the European Union
For each of the recorded animals the following data should be recorded:-
- Official EUROP carcass score for muscle,
- Official fat score.

f) Reference performance
The reference performance is the carcass weight per day of age. The calculation method is:-
- let AS be the age at slaughtering in days,
- let CW be the commercial carcass weight,
the carcass weight per day of age is equal to (CW * 1000) / AS.
4. **OFFICIAL SALES:**

1. **Introduction**

Many animals are sold routinely according to their live weight for finishing or to be slaughtered or for breeding.

This information is obtained routinely for commercial use.

Though this data was not field performance it may be considered as a beef performance recording.

2. **Field of application**

This recommendation fits any type of cattle sold before an age of thirty six months.

Data is collected in order to provide farmers with information useful for herd management and to provide raw data for genetic evaluations.

These animals may be calves, young bulls, steers and heifers.

They may be from crossing between specialised milk breeds and specialised beef breeds, or from dairy breeds or from beef breeds.

It requires the purchasers and the farmers to use the same animal identification.

3. **Description**

Performance recording which meets the following requirements fully complies with the recommendation for beef performance recording at official sales.

   a) **Symbol**

   The symbol of this recommendation is `OS`.

   b) **Method of recording**

   There is only a Method A. Weighing and other measurements have to be performed by an official for a commercial purpose with the agreement of the recording organisation.

   c) **Recorded animals**

   Records have to be obtained for all the animals sold from the same group of animals kept for the same purpose at the same location.

   d) **Mandatory records**

   For each of the recorded animals the following data should be recorded:
   - Animal Date of Birth,
   - Animal identification,
   - Date of weighing,
   - Live weight,
   - Coding of the farm which has sold the animal.

   e) **Reference performance**

   The reference performance is the weight per day of age.

   The calculation method is:

   let AS be the age at sale in days,
5. FINISHING HERDS AFTER WEANING TO SLAUGHTER:

1 Field of application
This recommendation applies to any situation where animals are reared from weaning for subsequent breeding or slaughter.

Data is collected in order to provide farmers with information useful for herd management and to provide raw data for genetic evaluations.

Animals may be calves, young bulls, steers or heifers up to 36 months of age.

They may be from crossing between specialised milk breeds and specialised beef breeds, or from dairy breeds or from beef breeds.

This recommendation may also apply to progeny test stations.

2 Description
The performance recording which meets the following requirements fully complies with the ICAR recommendation for finishing herds after weaning to slaughter.

a) Symbol
The symbol of this recommendation is `FH`.

b) Method of recording
The methods "A", "B" and "C" can be used.

c) Recorded animals
Records have to be obtained for all the animals kept for the same purpose at the same location.

d) Mandatory records
For each of the recorded animals the following data should be recorded:
- Animal Date of Birth,
- Animal identification,
- Date of weighing at the start of the finishing period,
- Live weight at the start of the finishing period,
- Date of the weighing at the end of the finishing period,
- Live weight at the end of the finishing period,
- Identification of the finishing farm,
- Identification of the management group within herd when they exist.

The intervals between weighings have to be two months (60 days) at least.

e) Recommended records
Each recording organisation may decide to carry them out. In that case they must be obtained for each of the recorded animals.
According to future ICAR recommendations for morphology records, linear scorings both for muscular and skeletal development as well as for functional capacity, may be recorded.

f) Reference performance

The reference performance is the average daily gain.

The calculation method is:

let AS be the age at start in days,

let AF be the age at finish in days,

let SW be the live weight at start,

let FW be the live weight at finish, 

the average daily gain is equal to $((FW - SW) \times 1000 / (AF - AS))$

SECTION 5.

Appendix A. Conformation Recording:

As defined by the responsible international organisation for each breed.

Reference conformation recording method.

1. Objective

This guideline is intended to standardise the methods of assessment of conformation.

2. Performance of the Bull

The assessment of the bull occurs in the first step of selection at the age of about one year, preferably during events which permit the comparison with a larger number of animals. All traits must be scored or measured linearly from one biological extreme to the other. The range of scores must be from 1-9.

Features which indicate the disposition for a genetically dismissable defect of a bull will be considered.

3. Assessment of Female Progeny

a) Selection of Bulls and Size of Sample

Conformation should be assessed for all test bulls. The sample must consist of at least 20 randomly selected daughters. At least 20 complete progeny groups should be included as a measure of comparison.

b) Traits

In all breeds such criteria should be considered as criteria which give an insight into performance traits or which have a limiting influence on the use of the animal.
c) Time of Assessment

The evaluation of the daughters of test bulls should occur during the first lactation, if at all possible during the first four months of lactation, but not before the 15th day after calving. Dry cows cannot be considered in the evaluation.

d) Method

The progeny is being described according to a linear system with a score 1-9. In addition, further traits of conformation may be assessed. Details of the procedure including the presentation of results will be laid down by the organisation of the breeds concerned.

4. Personnel

Personnel charged with inspection must behave neutrally and must take their training and in-service training centrally. In order that the influence of the inspector may be corrected, the timing and regional use of them must be such that a number of inspectors participate in the assessment of the progeny of one bull.

The number of inspectors working in a population must be such that at least 200 cows are being assessed per inspector per year.

5. Collection of Data for Analysis

For the assessment of progeny this includes the birth, calving, and inspection dates of the assessed animal, identify (lifetime tag) of the assessed animal and its parentage at least and, if available, dam and dam’s sire.

6. Publication

If breeding value assessment for conformation is not being carried out, the minimum information to be given for the publication of the results of the progeny assessment are:-

- number of daughters, farms and bulls in the group of comparison.
- for traits of description, standardised deviation.
- for traits, averages and standardised deviations.

Additional conformation recording methods - as defined by the responsible organisation for the breed.

APPENDIX A - ANNEX 1: CONFORMATION RECORDING IN BLACK AND WHITE CATTLE

The main objective of the Working Groups from the World Holstein Friesian Federation was to recommend a basis for harmonising type classification systems, including traits classification systems, evaluations and publications of type proofs for bulls.

Linear Type Traits

Linear classification is based on measurements of type traits. Advantages of linear scoring are:-

- Traits are scored individually.
Scores cover a biological range.
Variation within traits is identifiable.
Degree rather than desirability is marked.

Linear type traits can be divided in two groups, standard traits and optional traits.

**Standard Traits**

All standard traits recommended in this Annex satisfy the following conditions:-

- Linear on a biological scale.
- Single traits.
- Heritable.
- Of economic value.
- Possible to be measured instead of scored.
- Showing variation within the population.
- Essential.

**The following standard traits are recommended:**

### Trait Remarks

1. Stature  
   Height at the rump
2. Body depth  
   Depth of the rear rib
3. Rump angle  
   Hips to pins; 3 is level on a 9 point scale
4. Rump width  
   Pin width
5. Rear legs set  
   Angle; side view
6. Feet  
   Diagonal or foot angle (often difficult to score)
7. Fore udder  
   Strength of attachment  
   Attachment has economic value, length does not
8. Rear udder height  
   Distance between base of vulva (or pin bone) and top of milk secreting tissue
9. Central ligament  
   Named "udder support" earlier; cleft
10. Udder depth  
    2 is level with the hock on a 9 point scale
11. Teat placement  
    Front teats
12. Teat length  
    Front teats

**Optional Traits**

a) There are a number of additional traits which do not meet all the requirements of the standard traits. They can be added to the classification report of a country if required.

b) The Working Group considers two optional traits to be more significant than the others:-

   Chest width  
   Width of chest floor; named "strength" earlier; highly correlated with body depth and rump width.
Angularity Evidence of milk ability (not a single trait).

It is strongly recommended that each country should include these two traits in the system because breeders pay close attention to them when selecting sires.

Scale used for linear traits

1-9 scale must be used for all traits

**General Characteristics or Breakdowns for non linear traits**

a) General characteristics or breakdowns are combined traits which are not linear in a biological sense. A subjective score or description is given for the desirability of the cow according to the breeding goal.

b) It is increasingly difficult and of less importance to give recommendations for harmonisation of these traits than for linear traits. The following aspects seem to be important and should not cause too many problems in harmonisation.

c) The following breakdowns should be used as a minimum:-
   - Final score.
   - Dairy character.
   - Udder.
   - Feet and legs.

d) Each Breed Organisation should make sure that enough emphasis is put on each of the traits, especially the udder which should contribute a minimum of 40% to the final score.

e) For the estimation of composites from the linear traits, the results of further research on the economic value of the linear traits is needed.

**Classification System**

The following recommendations can be given concerning the administration of the classification system in a country:-

a) A national organisation should be in charge of classification systems.

b) Classifiers should be independent of commercial interest in a bull. Other countries should only accept foreign proofs which are controlled by national organisations that are independent of the owners of bulls.

c) There should be a national head classifier in charge of training and supervising the other classifiers. It is important to exchange information between head classifiers from different countries. It is recommended that international workshops should be conducted at least once between two World Breed Association Conferences, which means a minimum of every four years.

d) In addition to herd classification (all first calvers in the contributing herds) additional classification may be possible if completed by the national organisation and 5 or more herdmates are classified during the same visit.

e) All bulls in AI should be included in classification programs; no selection should be made among them after their production proofs.
Sire Evaluation

It is recommended for the calculation of type proofs that:-

a) The BLUP method (Individual Animal Model) should be used.

Advantages of the Animal Model are:-
- Allows repeated classification.
- Allows a correction for the merit of mates.
- Allows to bring in information from relatives, especially with exchange semen.

b) Data should be corrected for influencing factors such as age, stage of lactation or season.

c) Corrections for variation between classifiers may be made if necessary.

d) It is important that the classifier only classifies what he sees and corrections are made by the model.

Standardisation and Publication of Proofs

a) It is extremely important to publish the results of the evaluation of sires in all countries in the same way.

b) Bull proofs for linear traits should be standardised to make the different traits comparable.

The Working Group recommends:-

a) 0 should be used as the mean.

b) Proofs of widespread used bulls should be published as bar graphs covering the range between +3 and -3 standard deviations.

c) The standard deviation used in a country should be published.

d) Type proofs should be sent to data centres.