

SECTION 2.2 - ICAR RULES, STANDARDS AND GUIDELINES FOR **PERFORMANCE MILK RECORDING IN DAIRY SHEEP**

Section 2.2 contains corrections
approved by Astruc (19-06-2001)

2.2.1. The ICAR standard definitions of milk traits

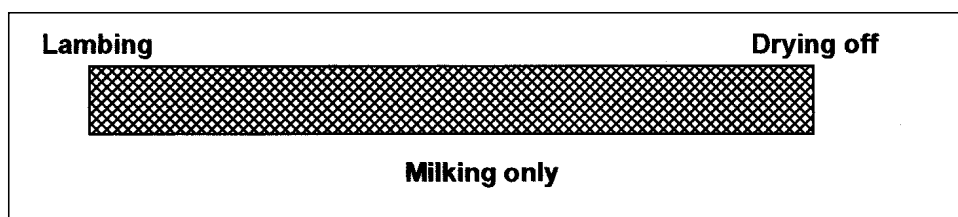
The following terms will be used to describe all possible livestock breeding systems:

- **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 starting when 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 (TMY)** is the milk yield produced in the case of lactation with milking from lambing (without suckling period).
- **total milked milk (TMM)** is the milk yield produced during the milking only period, in the case of lactation with milking only after a suckling period.
- **total suckled and milked milk (TSMM)** is the sum of the milk yield of the suckling period (milk suckled, or milk suckled plus that milked) plus the TMM.
- Only the milk yield during exclusive milking can be a 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 is over when the ewe dries off): it corresponds to the TMM.

The following situations therefore arise:

2.2.1.1 Milking from lambing

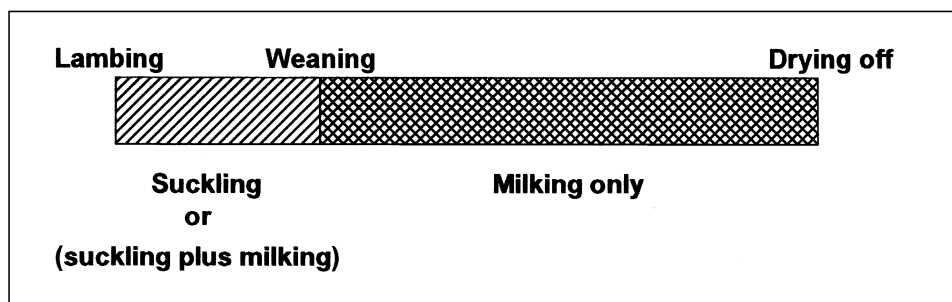
The ewes are milked after lambing (once the colostral phase is over) as is usually the case with dairy cattle.



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 (TMY).

2.2.1.2 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 (TMM) is therefore smaller than total milk yield during lactation (TSMM) : 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 (TMM).

2.2.1.3 Total milk yield and production of reference

Either the total milk yield per lactation (TMY or TSMM) or the milk yield during milking-only period (TMM) 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 in the publication of the results.

2.2.2. ICAR rules and standards

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

2.2.2.1 Responsibility and type of recording

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

employee in the method B, by the official tester and/or the farmer in the methods C and E)

:

- identification of animals by conventional or RFID devices, tattooing ~~(or by other forms of marking or electronic identification which are considered secure)~~ on the basis of the official regulation in vigor in thea national system ~~providing a unique 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.

Mis en forme : Surlignage

Whatever the method A, B, C or E 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 a recognised recording organization: for instance, in this case it may be a check on pedigree by blood group. Any information produced directly by the breeders (rather than an official recorder) must be subject to the supervisory procedure described by the recognised recording organization.

2.2.2.2 Ewes to be controlled

2.2.2.2.1 Case of the methods A, B, C

The breeder may split his flock 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 suckled or suckled and partially milked during the suckling phase ~~–(see chapter 1)~~ must not be included: it is impossible to measure the individual milk yield of suckled ewes or suckled and partially milked ewes simply and accurately (essential conditions 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 (see 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 must not to be included in the official recording for that farm. This is why it is essential that all ewes belonging to a breeder who

applies Method A or B or C milk recording for his flock(s) must be included in an up-to-date and accurate inventory.

2.2.2.2.2 Case of the method E

Method E is a flexible official method applied when the breeding purpose is to maintain the breed with all the typical standard performance signs (flocks without milk production and/or flocks whose only a part of the ewes belongs to the flock-book). In the first case, the rule of not recording suckling ewes may not be respected (the lambs must be removed at least 12 hours before the test-day). In the second case, the rule of recording all the animals of the flock may not be respected (only designated ewes or designated lactations are recorded). A comprehensive description of method E is available in the minutes of the meeting of the Working Group on Milk Recording of Sheep held in Interlaken on 28th May 2002

2.2.2.3 First test-day

2.2.2.3.1 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.

2.2.2.3.2 For a ewe

The first milk recording of a ewe must take place within the 35 days following complete separation from its lambs (method E excepted), 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.

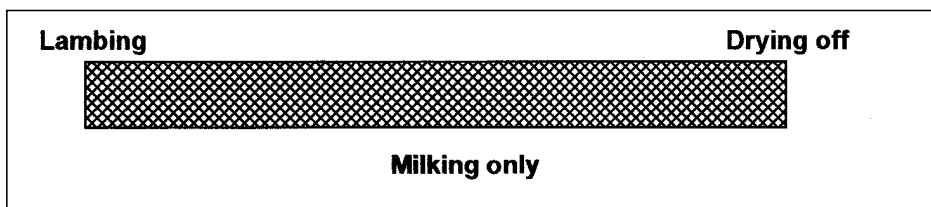
2.2.2.4 Frequency and number of milk recording visits

2.2.2.4.1 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, B4, C4 or E4 method, and it can reach respectively 36 and 42 days for A5, B5 or C5, and A6, B6 or C6 method. If only one daily milking is recorded (AT, BT, CT, AC, BC, CC, EC or ET 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 not a fixed 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.

2.2.2.4.2 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 is stopped at the test (i).

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).

2.2.2.5 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 ~~-(see~~ chapter 2.2.3). 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 nevertheless 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, B4, C4 or E4, method A5, B5 or C5, method A6, B6 or C6-). 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, BT, CT or ET) 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, BC, CC or EC).

Milk may be measured by weight (grams) 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 (grams) 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 ~~has been is not yet~~ available ~~since 1995. The devices approved for sheep are listed in the appendix 5 of the section 11.~~ In the meantime milk ~~should may~~ be weighted or measured by means of ~~a devicean instrument~~ approved by the organization using it ~~before 1 January 1995~~, and, if possible, checked by an appropriate government agency.

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2.2.2.6 Lactation calculation clauses

2.2.2.6.1 For the flock

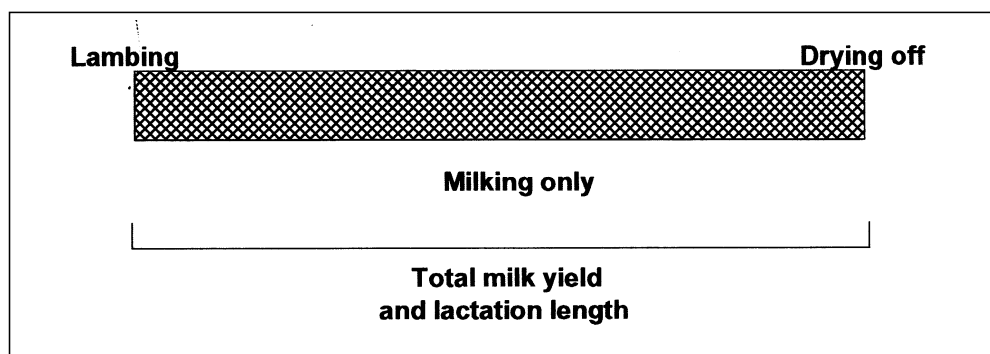
A farmer must adopt a single test method for a given milk period: method A (A4 or A5 or A6 or AC or AT), method B (B4 or B5 or B6 or BC or BT), method C (C4 or C5 or C6 or CC or CT), method E (E4 or EC or ET).

2.2.2.6.2 For a ewe

When milked from lambing, total milk yield per lactation (TMY) 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 (TMM) 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 (in the method E, as an exception, total suckled and milked milk – TSMM – may be calculated).

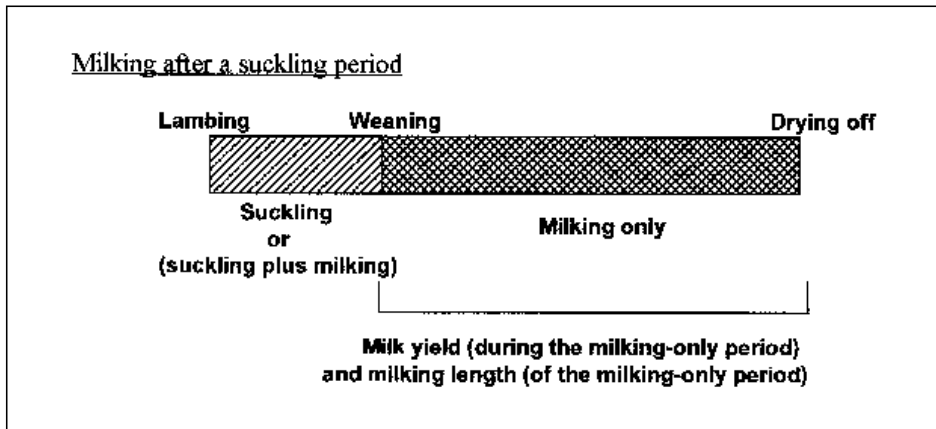
Calculations may be based on the real weaning and drying off dates. They may also be based on dates calculated on the basis of standard lengths for the suckling period and the interval between the last non-zero milk recording and drying off. The whole calculation procedure is defined by each country and/or breed, in which case it is necessary for the calculation clauses to be accurately described when the results are presented (see chapter 2.2.4).

Milking from lambing



The total milk yield per lactation (TMY) 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 (TMM) 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.

2.2.2.7 Quality assurance regarding AC method

This paragraph has been built to solve specific problems with regards to AC method. However, the described procedure may naturally also be applied to BC, CC, EC methods. It concerns also the AT, BT, CT and ET methods.

The AC method requires the information of the whole milk of the flock produced over 24 hours to calculate the AC coefficient applicable to each ewe recorded at the recorded milking to obtain a daily production. Some situations are identified in which the AC method procedures cannot be applied without producing biases:

-Flocks where a part is registered and therefore recorded, whereas the bulk milk contains the whole flock. This is particularly frequent in countries/breeds where the milk recording practice is laborious and can be supported by the farmer only for a part of the whole flock. In some situations, permitting farmers to record only a portion of their flock should allow to increase the average size of the recorded flocks (due to the fact that some large flocks would adhere to milk recording if they are allowed to record only a part of the flock). This strategy is to contribute to increase the cost-effectiveness of milk recording, by sharing costs related to the visit of one flock on a larger number of recorded ewes, but also to increase genetic progress.

-Flocks where a part of the ewes are milked once a day whereas the other part is milked twice a day. Once a day – milking is becoming more and more frequent in some production systems, in order to reduce labor, for example to save time for home making cheese, as well as to reduce energetic costs. Once a day milking may occur at the end of the lactation period (early summer) only for ewes that lambed in autumn whereas ewes that lambed later are still milked twice a day.

Even though such practices should not occur regarding the guidelines, a procedure of quality assurance is proposed both to control and ~~to~~ elaborate an alternative AC coefficient. The main features of the procedure are described below, the entire procedure being available in a document produced at the ICAR meeting held in Cork on 29 May 2012 and displayed on the ICAR website. Basically, this procedure consists in introducing one monthly record at the two milkings per flock-year in order to check the quality of the AC design in the flock. This approach should permit to obtain a flock coefficient (average of individual coefficients) either to be directly applied to all test dates or to check the quality of the actual AC coefficients.

Nevertheless, before setting up the procedure of quality assurance, which may be costly, and to avoid it if possible, it must be strongly suggested beforehand to the breeder to separate the ewes not registered or, in the case of systems with ewes milked once a day, either to separate the ewes milked once or to identify them. Such practices should permit to calculate and apply the AC coefficient only for appropriate ewes.

Mis en forme : Non Surlignage

Applying the procedure of quality assurance is optional. It is up to the organization to decide to apply it, as far as the situation requires it. The procedure solves the problem regarding milk yield but not samples.

2.2.3. ICAR Guidelines on Optional Records

This chapter describes:-

- On the one hand, the optional records which can be kept within the framework of official method A, B, C or E recording.
- On the other hand, the method D which is a non-official method of milk recording.

2.2.3.1 Qualitative tests or tests on the milk's chemical composition in official method A, B, C or E

Given that it is expensive and often technically difficult to administer in large flocks, testing 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 recorded population. In the second case, the qualitative test must be part of the flock's monthly quantitative recording (A4, B4, C4 or E4, AC, BC, CC, EC, AT, BT, CT, ET) or approximately monthly quantitative recording (A5, B5 or C5, A6, B6 or C6), 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 reference sample of the recorded milkings. The equipment used for determining fat and protein content should be submitted to periodic checking in accordance with suitable standards, approved by ICAR.

2.2.3.2 Recording of udder morphology

Among the functional traits whose interest is growing with the global purpose of reducing the costs of production, the traits related with udder health and udder morphology are more and more recorded. Whereas somatic cell count is a standard indicator for udder health, the scoring of udder morphology takes different forms according to the breeds and the countries.



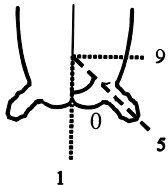
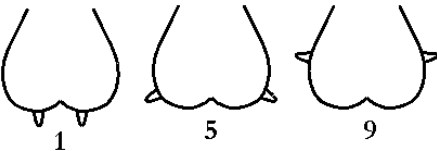
This chapter aims at (i) proposing different traits that may be scored, according to the specificity of each breed, (ii) listing references for genetic parameters, especially regarding the relationship between milk traits and udder traits. There is no recommendation, because there is at this stage no need of harmonization.

This chapter widely uses results presented at the workshop “udder recording comparison between teams, which was held in Leon, Spain (27-29 May 2002) in the framework of the EU contract QLK5-2000-00656 “Genesheepsafety”.



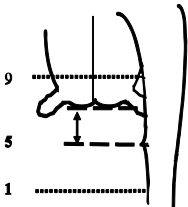
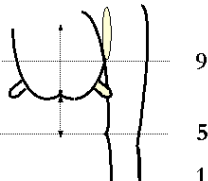


As in cattle (section 5.1 of the guidelines), linear traits are scored individually, the scores covering a biological range. They describe the degree of trait, not the desirability. The recommended scale is 1-9. Udder appraisal tables contain several traits. The traits scored in at least one breed/country are the following:

1. Teat position
2. Udder depth
3. Udder attachment
4. Udder cleft
5. Teat size

1. Teat position




Spanish Churra	Vertical = 9	Horizontal = 1
		
What is scored ?	Teat placement	
French Lacaune	Vertical = 1 Horizontal = 9	
What is scored ?	right teat angle	
Italian Sarda	At the bottom and vertical = 1 Lateral at the lower part = 5 Lateral at the higher part = 9	
		
What is scored ?	udder cistern height	

2.Udder depth

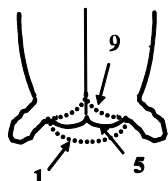
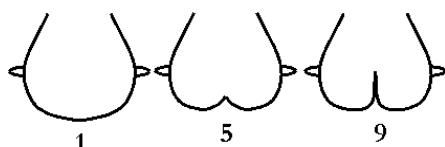
Spanish Churra	Shallow = 1 	Deep = 9 
What is scored ?	udder depth respect to abdomen basis	
French Lacaune	Deep = 1 Shallow = 9	
What is scored ?	distance between udder floor and hock	
Italian Sarda	Deep = 1 Shallow = 9	
What is scored ?	distance between udder cleft and hock	
Israelian Afec Assaf	Shallow = 1 	Deep = 9 
What is scored ?	Udder depth respect to abdomen basis	

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3.Udder attachment

Spanish Churra	Wide = 9 	Weak = 1 
What is scored ?	perimeter of insertion to the abdominal wall	
Italian Sarda	Width larger than height = 9 Width equals height = 7 Width smaller than height = 1 	
What is scored ?	ratio: udder height / attachment width	

4.Udder cleft

French Lacaune	Missing = 1 Well marked = 9 
What is scored ?	furrow
Italian Sarda	Missing = 1 Average = 5 Well marked = 9 
What is scored ?	udder separation

5. Teat size

Spanish Churra	Short = 1	Long = 9
		
What is scored ?	teat size	

The traits described above and the corresponding tables (list of traits included in udder appraisal) might be updated by either by other breeds/countries implementing udder morphology recording, or by the above breeds/countries if their traits or table evolve. Please inform the chairman of the working group on dairy sheep to make the list of traits / table update if necessary.

References about genetic parameters of the traits estimated in the countries where the tables described above are used.

Barillet F., Astruc J.M., Lagriffoul G., 2007. Taking into account functional traits in dairy sheep breeding programs through the French example. EAAP publication No.121, 2007. Proceedings of the 35th Biennial Session of ICAR, 6-10 June 2006, Kuopio, Finland.

Casu Sara, Pernazza I., and Carta A.. 2006. Feasibility of a Linear Scoring Method of Udder Morphology for the Selection Scheme of Sardinian Sheep. J. Dairy Sci. 89:2200–2209.

Fernandez G., Baro J.A., de la Fuente L.F., San Primitivo F., 1997. Genetic parameters for linear udder traits fort dairy ewes. J. Dairy Sci. 80, 601-605

Gootwine E., Alef B., Gadeesh S., 1980. Udder conformation and its heritability in the Assaf (Awassi x East Friesian) cross of dairy sheep in Israel. Ann. Génét. Séle. Anim. 1980, 12 (1), 9-13.

Marie-Etancelin C., Astruc J.M., Porte D., Larroque H., Robert-Granié C., 2005. Multiple-trait genetic parameters and genetic evaluation of udder-type traits in Lacaune dairy ewes. Livestock Production Science 97 (2005) 211-218.

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2.2.3.32 Other types of testing in official method A, B, C or E

Other possibilities following on from the qualitative milking recording include somatic cell count, mastitis 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, the open day-time from lambing to conception, etc.

Procedures for such optional measurements are described by the officially recognised organizations responsible for their implementation.

2.2.3.43 Method D

Method D is defined as a simplified non-official recording based on 2 to 4 recordings per flock and per year in the aim to get 2 to 3 test-days per ewe in the middle of the lactation. The record may be realized either on one of the daily milkings on all the ewes being exclusively milked at the test-day, or on all the daily milkings on all the ewes being exclusively milked at the test-day. Of course, it is recommended to record only one of the daily milkings since it is a very simplified method. In this case, the test-day may be adjusted in order to get a daily milk (for instance by multiplying it by 2 or by any other coefficient taking into account the morning/evening difference). The purpose is to implement a within flock ranking of the ewes (either an individual ranking or a ranking in sub-parts of the flock - in three thirds or four quarters for example) to manage replacement and culling. The ranking may be based on such criteria as average test-day or lactation calculation corrected or not for variation factors such as lactation number, age, month of lambing... Nevertheless, in such a simplified design, lactation calculation is not recommended even though possible, given the low number of test-days per ewe. This method D may be useful in two types of situation:-

- it may be applied to commercial flocks out of a well established nucleus of a pyramidal breeding scheme.
- this type of simplified milk recording should also be suitable in developing countries in order to provide advice to farmers on feeding, health, breeding (and if possible on genetics). In this situation, it could be the first step before the implementation of an official recording for genetic purposes.

Whatever the situation, method D does not provide ICAR stamp.

2.2.4 ICAR Rules on Presentation of Results

This paragraph concerns the methods A, B, C or E

To facilitate the presentation, the following vocabulary is used for milk yield calculations:

- total milked yield, total milked milk and
- milking length.

Milk yield equals:

total milk yield per lactation (TMY) in the case of milking from lambing or
milk yield during the milking-only period (TMM) 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

2.2.4.1 (Obligatory results)

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

2.2.4.1.1 Information on the milk recording and calculation methods

- organizations responsible for the milk recording
- method of quantitative recording used: method A4, B4, C4 or E4 , A5, B5 or C5 , A6, B6 or C6, AT, BT, CT, ET, AC, BC, CC or EC
- 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
- lamb weaning date (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 milk yield
- calculation of milk yield: based on the real length of milking or a standard length to be described
- published milking length: provide the calculation formula [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.

2.2.4.1.2 Information on the flocks subject to official method A, B, C or E 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.

2.2.4.1.3 Information on the ewes

The following information must be provided for each lactation whose obligatory results are published:

- the ewe's ID
- age at lambing
- lactation number or category of age (to be described)
- in the case of suckling, the real or standard suckling length
- milk yield (without adjustment) : TMY or TMM
- 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)

2.2.5 ICAR guidelines on Publication of Results of Optional Recording

2.2.5.1 Information on the implementation of qualitative milk recording

This paragraph concerns the methods A, B, C or E (§ 2.2.3.1 and 2.2.3.2) and the method D (§ 2.2.3.3)

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
- existence of supervisory systems or no: type and description.

2.2.5.2 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. Open day-time from lambing to conception.
- 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.

2.2.5.3 Other optional results

These results can be provided for the breed, flock or ewe or region. 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.

Method D

Precise description of method D used as a simplified design :

- design (number of recordings per flock and year),
- calculations and type of ranking set up.

Whatever the design, calculation and type of ranking, method D has no ICAR stamp.

SECTION 2.2 - ANNEX 1 - THE RULES AND STANDARD OBLIGATORY IN ALL SITUATIONS

2.2.1. 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). In the case of method E, these rules may not be respected.

2.2.2. 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 ~~150200~~ g or ~~150200~~ ml.
- The limit of error (standard deviation or error) is 40 g or 40 ml.

2.2.3. Frequency of milk recording visits

• Monthly Method

Recording Length Hours	Average Daily Recording Interval ($\pm 10\%$)	Symbol	Authenticity
24	30	4	A4/B4/C4/E4

• Others

Interval Number 36			
24	36	5	A5/B5/C5
Interval Number 42			
24	42	6	A6/B6/C6
Alternate Milkings			
24	30	T as a second letter	AT/BT/CT/ET
Corrected Milkings			
24	30	C as a second letter	AC/BC/CC/EC

Interval depending on the situation of the lambings in the flock

NB1:

AT, BT, CT, ET

alternating monthly test (recording of only one of the two daily milkings)

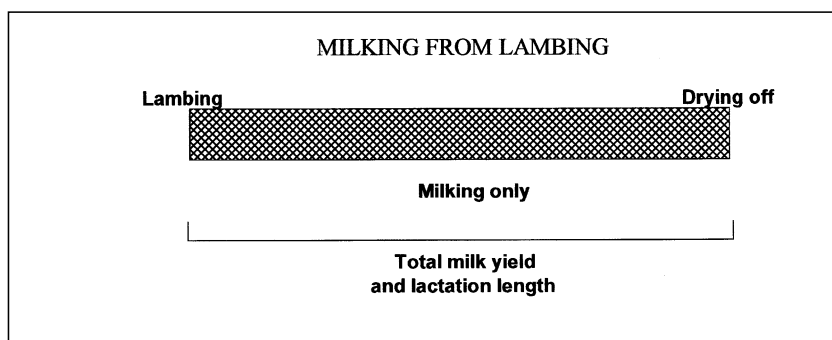
AC, BC, CC, EC

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).

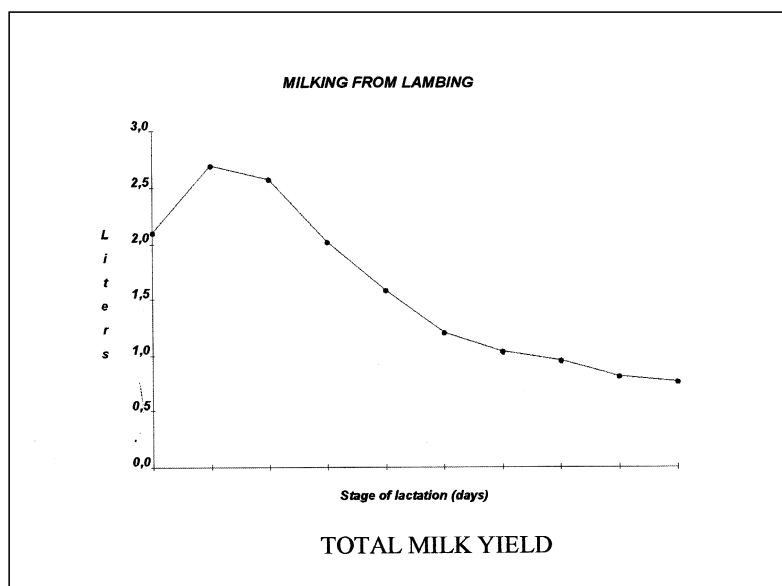
NB2:

No set total number of recording visits per year (described by each official organization).

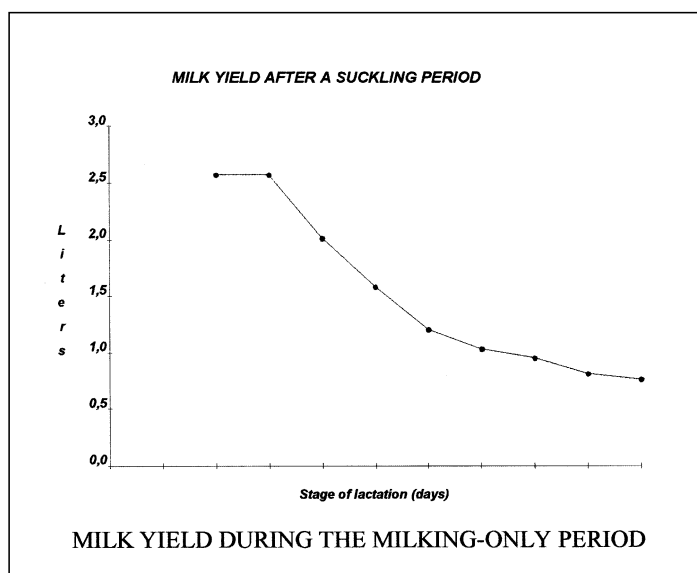
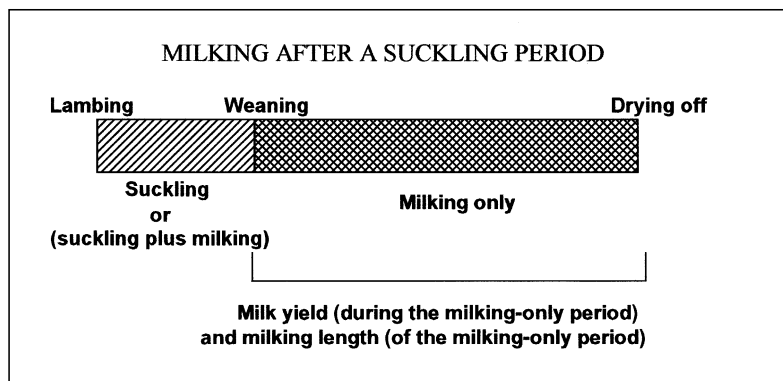
SECTION 2.2 - ANNEX 2 - LACTATION CALCULATION CLAUSES IF MILKING FROM LAMBING



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).



SECTION 2.2 - ANNEX 3 - LACTATION CALCULATION CLAUSES IF MILKING AFTER A SUCKLING 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).