

## Report of Milk Recording in Sheep Working Group

J.M. Astruc<sup>1</sup>, F. Barillet, A. Carta, E. Gootwine, D. Kompan, F.J. Romberg, A. Tondo, E. Ugarte

<sup>1</sup>Institut de l'Élevage, BP 27, 31326 Castanet-Tolosan, France

*Working group members: Jean-Michel Astruc (France-chairman), Francis Barillet (France), Antonello Carta (Italy), Alessia Tondo (Italy), Elisha Gootwine (Israel), Drago Kompan (Slovenia), Franz-Josef Romberg (Germany), Eva Ugarte (Spain)*

### **Abstract**

The report of the working group on milk recording in sheep presents an overlook of its activities over the last two years, in relation with the terms of reference of the group. The main activities have concerned the on-line enquiry, which is open to every ICAR members which would like to enter data. The report focuses on the valorization of the data base, using data from 11 countries. Emphasis is given on the increasing use of simplified methods of quantitative and qualitative recording. Another important activity is the cooperation with other bodies of ICAR, especially in relation with recording devices, about the requirements of the accuracy of the devices. New prospects are on-going, related to the guidelines (relevance of the guidelines in some situations, inclusion of udder morphology in the guidelines).

*Keywords : dairy sheep, milk sheep, milk recording, guidelines, ICAR.*

## **1.0 Introduction**

The terms of reference of the Working Group on Milk Recording in Sheep (MRSWG) may be synthesized in four main items: evolution of the guidelines, cooperation with relevant bodies of ICAR, dairy sheep enquiry, contact with non-ICAR organizations in the dairy sheep field. The main activities of the MRSWG during the last 2 years have focused, firstly on the cooperation within ICAR, especially with the sub-committee involved in recording devices, secondly on the on-line enquiry implemented since May 2006, and thirdly on the perspectives of work. A valorization of the on-line enquiry is presented in this report, permitting to establish the state of the art on different topics related to the terms of reference of the working group. Basically, a key objective of the group is to spread simplified methods of recording, especially qualitative recording, while keeping the relevance of the measures for genetic purposes. The objective is also to cope with new traits, such as udder morphology.

## **2.0 Main activities of the working group during the last two years**

### **2.1 Constitution of the Working Group**

We started 2 years ago a process for renewing the members of the Working Group, after some "historical" members have retired or left the group. In this context, Antonello Carta and Eva Ugarte entered the group in 2008. In 2010, Alessia Tondo from AIA is proposed to replace Mauro Fioretti. Moreover, as the chair of the Goats Working Group has changed (Zdravko Barac from Croatia has replaced Drago Kompan from Slovenia), Zdravko Barac naturally should become member. Finally, discussions are on-going to introduce a Greek member, in order to have a representative of the larger European country regarding the dairy sheep population. The actual members are:

- -Jean-Michel Astruc, Institut de l'Élevage, France
- -Zdravko Barac, Croatian Agricultural Agency, Croatia

- -Francis Barillet, INRA, France
- -Antonello Carta, AGRIS Sardinia, Italy
- -Alessia Tondo, AIA, Italy
- -Elisha Gootwine, Volcani Center, Israel
- -Drago Kompan, University of Ljubljana, Slovenia
- -Franz-Josef Romberg, Dienstleistungszentrum Ländlicher Raum Westpfalz, Germany
- -Eva Ugarte, Neiker, Spain

## ***2.2 Meetings involving the Working Group of Milk Recording in Sheep***

Meetings of the Working Group - The last meeting of the MRS WG was held in Niagara Falls (USA) on 17th of June 2008 with 5 attending participants. The main issues of the agenda were the changes in the constitution of the Working Group, the overview of the main activities of the group over the last 2 years, the presentation of the results of the on-line dairy sheep enquiry, the co-operation with other ICAR bodies (recording device, milk analysis, recording of goats), the perspectives of work.

The next meeting will be held in Riga on the 1st of June 2010. Between two biennial sessions, the exchanges are mainly done by e-mail.

Meeting of the ICAR Board with Chairperson in Porec (Croatia) on 11th May 2009 – The chairman of the Working Group did not attend this meeting. A synthesis of the work of the group had been sent before.

## ***2.3 Updating the ICAR Guidelines of sheep milk recording***

The last evolutions date back to 2005 and are reported in the guidelines published in the booklet "International Agreement of Recording Practices" (ICAR guidelines, 2008), in the section 2.2.

A new issue was raised at Niagara Falls by Antonello Carta, about difficulties to meet the guidelines in some conditions: (a) due to difficulties in organizing the milk recording and reproduction activities for a large number of ewes, some large size flocks have a part of the ewes which are registered and another part non-registered (there is no evidence of preferential treatments of the registered part of the flock); (b) some farmers are used to milking part of the flock twice and another part only once; this practice is particularly spread at the end of the milking period (May-June-July) when pre-milking ewes are always milked twice while adult ewes are often progressively dried-off by decreasing the milking frequency.

These two points make the AC recording difficult to implement and might exist in other situations/countries and must therefore be tackled by the MRS WG. To go further, it has been demanded to Antonello Carta a short report to present the problem at the meeting of Riga, in order to propose if necessary emendations of the guidelines, or at least recommendations or experimentations/studies to face this situation.

In addition, it was intended to develop a glossary of the main terms specifically related to dairy sheep. This task has not yet been completed.

## ***2.4 Co-operation with the relevant Sub-Committees and Working Groups of ICAR***

The MRS WG co-operated over the last 2 years with the following bodies of ICAR:

-Cross-participation with the Working Group on Milk Recording in Goats, the chairman of each group participating at the work of the other group.

Co-operation with the Sub-Committee on Milk Recording Devices about the requirements for sheep. As the requirements in cattle has been relaxed, the concern is about the opportunity to relax or not the requirements of the meters in sheep as well. Up to now, and regarding the fact that two meters

have been agreed for sheep over the last 4 years, the group considers the guidelines as relevant. Nevertheless, this issue must be discussed at the next meeting of the group in Riga.

## **2.5 Dairy sheep enquiry on-line**

Since May 2006, the on-line database has been ready to accept submission of data. The database has been developed with the help of ICAR Secretariat. The purpose was to get data about the situation of milk recording in sheep, and related connected issues such as breeding schemes, selection criteria, molecular information in sheep, recording devices. This annual survey constitutes one of the main terms of reference of the MRS WG.

The dairy sheep enquiry is divided in 7 tables, representing 7 different topics.

- -Basic information on population, recording methods and percentages
- -Milk yield: type of lactation calculation + milk yield results
- -Optional test for milk composition
- -Recording of non-milking traits
- -Milk recording equipment used in case of machine milking
- -Breeding programs using insemination (AI)
- -Molecular information

The raw data of the survey will be put on the ICAR Website.

The first results of the on-line enquiry were presented at the Niagara Falls Session: general presentation at the Technical Session on Sub-Committees, Task Forces and Working Groups, detailed presentation at the meeting of the WG. Moreover, the slides synthesizing the data are available on the ICAR website, in the page dedicated to the Milk Recording of Sheep WG ([http://www.icar.org/pages/working\\_groups/wg\\_sheep\\_milk.html](http://www.icar.org/pages/working_groups/wg_sheep_milk.html)).

Basically, all ICAR members should have answered the enquiry, even to declare no dairy sheep breeding. Finally, members with no dairy sheep milk recording do not answer the enquiry. More disappointing, some countries with substantial population of dairy sheep do not answer the questionnaire, despite sometimes several recalls.

On the whole, since 2008, 10 countries have answered the on-line enquiry at least once, a 11th country sending information without using the ICAR site. We acknowledge these countries for this co-operation and for their help to have an updated overview of the situation of dairy sheep milk recording.

The main results of the on-line enquiry are described below. Additional tables which could not be included in this report are available on the ICAR website.

## **3.0 Dairy sheep enquiry on-line: situation of milk recording in dairy sheep**

### **3.1 Situation of milk recording in dairy sheep**

The table 1 summarizes the impact of milk recording in the countries having answered the on-line enquiry over the last 3 years.

Official milk recording is carried out in every country and represents on the whole 1,209,305 ewes. If we look at the countries with the largest dairy sheep population, situated in the Mediterranean area (Greece, Italy, Spain, France), the impact of milk recording is quite different: high in France (57.6% on the whole, 20.9% when considering only official milk recording), medium in Spain and Italy (respectively 10.0% and 8.5%), low in Greece (1.3%). Italy has the highest recorded population (480,000 ewes). Italy, France and Spain represent 89% of all sheep in official milk recording.

In the other countries, with smaller population, milk recording represents few flocks and ewes, from 488 ewes in Belgium to 18,600 ewes in Israel. The other countries are (ordered by ascending number of recorded ewes): Germany, Czech Republic, Slovenia, Croatia, Slovak Republic.

Table 1. Size of population of dairy sheep, impact of quantitative recording and recording designs in ICAR member countries.

Countries Year	Size of population	Quantitative recording (official milk recording)		Methods used
		Number of recorded ewes	% recorded ewes	
Belgium 2009	593	488	82.0	AT
Croatia 2009	34,500	7,770	22.5	AT
Czech Rep. 2009		821	-	AT (part), E (part)
France 2009	1,445,000	301,823 <sup>1</sup>	20.9	AC
Germany 2009	8,204	638	7.8	A4 (34%), AT (29%), E (37%)
Greece 2007	7,034,000 <sup>2</sup>	90,834	1.3	A4
Israel 2007	35,000	18,600	53.1	On-farm, daily basis
Italy 2009	5,617,000 <sup>2</sup>	479,897	8.5	AT, AC
Slovak Rep. 2009	220,000 <sup>2</sup>	17,884	8.1	AC
Slovenia 2009	4,900	3,749	76.5	AT
Spain 2008	3,064,000	305,402	10.0	AT (77%), A C (18%), A4 (5%)

<sup>1</sup> In addition, 531,299 ewes are recorded with D method (non official milk recording) without qualitative recording

<sup>2</sup> Figure from <http://faostat.fao.org/>

The table 2 illustrates the increasing impact of official milk recording in most of the countries over the last 20 years. This growth has been favored by the steadily increasing adoption of simplified design of official milk recording, such as AT or AC method. Whereas in 1988, 2 countries only used simplified method (France with AC method, Spain with AT method in Latxa breed), this number reached up to 6 countries in 1998, and 8 countries in 2009. Promoting simplified methods of milk recording has been a leitmotiv of the Working Group since it has been created in the eighties, with the aim to compensate as far as possible the high cost of recording in small ruminants by reducing the number of measures.

The use of the D method, which is a non-official and "free-of-rules" milk recording, is described only in France. In France, this very simplified method consisting in 2 to 4 flock-visits per year, whatever the visit intervals (monthly to bimonthly), is implemented out of the nucleus scheme and is mainly devoted to a within-flocks valorization to help the breeder to optimize culling and replacement. D method is a quantitative recording.

The additional tables, available on the ICAR website, show that three breeds are up to 100,000 recorded ewes: Sarda and Valle de Bèlice (Italy), Lacaune (France). Sarda breed has the more important population with nearby 250,000 recorded ewes.

Table 2. Evolution of official milk recording over the last 20 years in ICAR member countries.

1988				1998				2010			
Record	ed ewes (official)	% Method		Recorded ewes (official)	% Method		Recorded ewes (official)	% Method			
Italy	140,000	2.8	A4	331,024	5.0	A4	479,897	7.8	AT /AC		
France	202,000	16.8	AC	281,070	20.9	AC	301,823	20.9	AC		
Spain	110,000	2.8	AT	141,044	6.2	AT	305,402	10.0	AT/AC/A4		
Greece	37,000	0.5	A4	26,600	0.3	A4	90,834	0.8	A4		
Portugal	7,600	1.5	A4	38,571	15.2	A4/AT	-	-	-		
Croatia	-	-	-	-	-	-	7,770	22.5	AT		
Israel	-	-	-	6,200	12.4	B4/AC	18,600	53.1	-		
Slovak R.	-	-	-	5,100	2.3	A4/AC/AT	17,883	8.3	AC		
Slovenia	-	-	-	1,474	19.8	A4	3,749	76.5	AT		
Germany	356	2.2	A4	836	3.3	A4/B4	638	7.8	A4/AT/E		
Czech R.	-	-	-	177	35.0	AT	821		AT/E		
<b>Total</b>	<b>496,956</b>			<b>832,096</b>			<b>1,227,417</b>				

Table 3. Qualitative recording in ICAR member countries.

Q	Qualitative recording				
	Countries Yes/Not	Recorded ewes	% of the recorded ewes	Method used	Categories of ewes (lactation)
Belgium	No	-	-	-	-
Croatia	Yes	4,619	59%	AT	
Czech Republic	Yes	821	100%	AT/E	
France	Yes	84,166	28%	Part-lactation sampling (AC)	Lacaune : L1/L2 Pyrenean breeds : L1
Germany	Yes	602	100%	A4/AT/E	
Greece	Yes	?	?		
Israel	No	-	-	-	-
Italy	Yes	25,108	5%	Part-lactation sampling (AC)	Sarda : L1
Slovak Republic	Yes	17,883	100%	AC	L1/L2/L3
Slovenia	Yes	3,749	100%	AT	
Spain	Yes	?	?	AT,AC	

### 3.2 Simplification of qualitative recording in dairy sheep

Conversely to dairy cattle, qualitative milk recording is optional in official milk recording in sheep, as established in the ICAR guidelines (ICAR guidelines, 2008), considering that the cost of qualitative milk recording may be crippling and that qualitative recording becomes useful and necessary only when selection on milk yield is efficient. Simplified designs are strongly recommended to reach some cost-effectiveness. The main features of the table 3 can be summarized as following:

- The impact of qualitative recording among the recorded population is high only in countries with a quite small population (from 59% in Croatia to 100% in Czech Republic, Germany, Slovak Republic and Slovenia).
- In countries with a large population, the impact reaches 41% in Spain, 28% in France and 6% in Italy. Qualitative recording concerns only some breeds, some parities (lactation 1 or lactation 1 and 2). It is implemented within a simplified design of milk recording, with one sample per test-day (AC or AT method).

### 3.3 Definition of milk traits (see additional table on [www.icar.org](http://www.icar.org))

Regarding the diversity in the exploitation of the lactation through milking ([a] milking-only period preceded by a 1-2 month suckling period before the weaning of the lamb(s) in most breeding systems; [b] milking from lambing in some other systems as in Germany, Israel, and more and more in Spain), the guidelines have precisely described the different terms of lactation calculation according to the system. Moreover, without ruling out any type of calculation, ICAR has recommended to compute the lactation at the milking-only period (TMM = total milked milk) in the system [a] and the total milk yield (TMY) in the system [b].

Actually, the yields given in the enquiry still show a large diversity in the methods of computation, preventing from any comparison between breeds/countries.

### 3.4 Milk recording equipment (see additional table on [www.icar.org](http://www.icar.org))

ICAR has recently agreed two on-farm milk meters for sheep. No portable meter has been agreed until now. The enquiry underlines wide variety of devices (jars or meters, measuring volume or weight, with or without sampler, from local or multinational manufacturers) used in the different countries. The questionnaire should be adapted, at least to enhance the impact of these newly agreed meters that cannot be detected with the current answers.

### 3.5 Breeding schemes, objective and selection criteria

Breeding programs based on progeny-test of rams by AI or by combining AI and controlled natural mating are implemented in a few breeds, in France, Italy and Spain (table 4). AI is not widespread (at the exception of France) and is mostly realized in fresh semen. 573,570 AI are realized in France, Italy and Spain, 84% of them in France. AI is practiced with a low dilution and with synchronization of the heat (one AI per ewe, whatever the result, return being realized by natural mating). The selection criteria are still based on milk yield on most situations, with, in addition, fat, protein (Churra), udder morphology (Sarda). Only the Lacaune breed has included in its selection criteria somatic cell count (SCC) and udder morphology in addition to the production traits, giving the same weight on the one hand to production traits and on the other hand to udder functional traits (SCC and udder morphology).

The strategy of implementing efficient breeding program for local breeds seems to have had different kind of achievements, according to the countries / breeds. Indeed, some "foreign" breeds are more and more spread in more and more countries: East Friesian in the northern and central European countries, Assaf particularly in Spain, Lacaune everywhere. Both Lacaune and East Friesian are mentioned as recorded in Spain, Italy, Slovak Rep., Germany, Czech Rep. For the first time in 2008, recording of Assaf and Lacaune breeds are reported in Spain, with a quite important recorded population of 76,000 ewes (one fourth of all recorded ewes in Spain).

### 3.6 Other topics

Other additional tables ([www.icar.org](http://www.icar.org)) present information about the following topics: molecular information in sheep and recording of other traits.

Table 4. Importance of breeding programs and selection criteria <sup>1</sup>.

Country	Breed	AI progeny-tested rams	AI	Selection criteria <sup>2</sup>
France (2009)	Lacaune	445	395,812	(FY+PY+F%+P%) + .5 SCC + .5 Udder
	Manech Red face	151	56,760	FY+PY+F%+P%
	Manech Black face	36	7,869	FY+PY+F%+P%
	Basco-Béarnaise	52	14,128	FY+PY+F%+P%
	Corse	31	6,336	MY
Italy (2007)	Sarda	60	13,500	MY + Udder
Spain (2008)	Latxa blond faced	30	9,210	MY
	Latxa black faced	50	15,103	MY
	Karrantzana	2	300	MY
	Manchega	150/175	35,764	MY
	Churra	51	12,300	MY + P%
	Assaf	60	6,488	

<sup>1</sup> MY=milk yield, FY=fat yield, PY=protein yield, F%=fat content, P%=protein content, SCC=somatic cell count, Udder=udder morphology

<sup>2</sup> most of the breeding schemes include selection for scrapie resistance (PrP gene)

## 4.0 Conclusion

Over the last two years, the Milk Recording of Sheep WG has mainly focused, a part the on-line enquiry and its valorization, on starting new topics and maintaining co-operation with other bodies of ICAR, especially in the field of recording devices. Among the new topics, the group must cope with the specific situation where meeting the guidelines is difficult. It should be proposed emendations of the guidelines in the next few years. Moreover, it is intended to prepare a glossary of the main specific terms of the guidelines for sheep, to describe in the guidelines the scoring of udder morphology made by different countries. The issue of the requirements about the agreement of recording devices is recurrent and is still discussed. Relaxing the requirements is not relevant with the challenge of the group which encourages simplified methods of recording, especially for qualitative recording, while keeping enough relevance to each individual measure. Finally, the

on-line enquiry is a useful and collective tool that should be filled in by all the countries with dairy sheep population.

## 5.0 References

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ICAR website. [www.icar.org](http://www.icar.org)