



THE GLOBAL STANDARD
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Milk recording in sheep and goat: state of the art and materials used for recording and sampling

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Session 6

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TOLEDO **SPAIN**

Outline

- ❑ State of the art from yearly survey on sheep and goats milk recording
- ❑ The issue of recording and sampling in sheep and goat
- ❑ Specificity of small ruminant milk
- ❑ The devices used for milk recording and sampling in sheep and goat

ICAR Working Group on sheep goat and camelid (SGC-WG)

Sheep, Goat
and Camelid
WG

Topics
included in
the surveys
on dairy
sheep and
goats

Among Terms of Reference:

- Conduct and report results of periodic **surveys** on sheep, goat and camelid performance recording and genetic evaluation.
- Maintain **relationships with** other groups, especially **MRSD-SC**

1a - Milk recording and management of the lactation

1b - Methods of milk recording

2a - Type of lactation calculation for milk yield

2b - Milk yield result

3 - Optional tests for milk composition

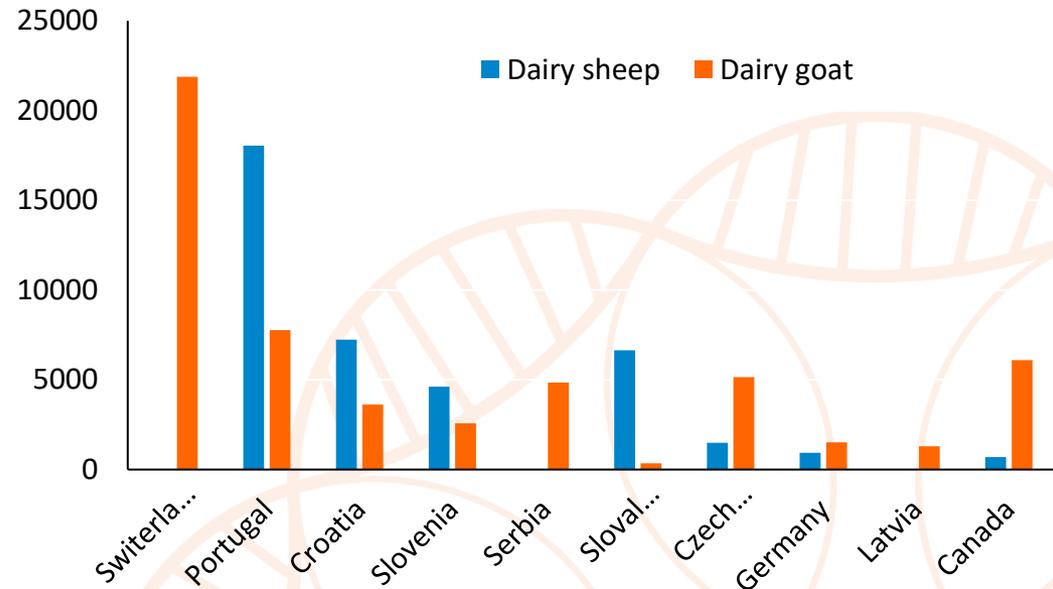
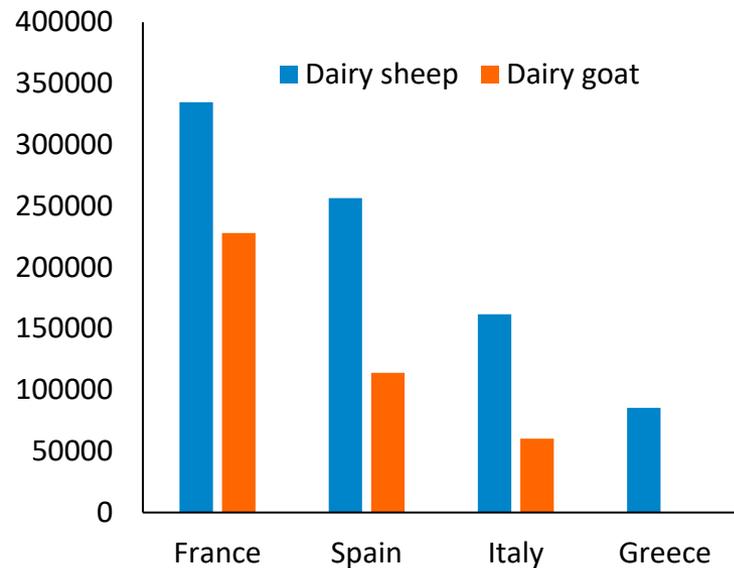
4 - Recording of non-milking traits

5 - Milk recording equipment used in case of machine milking

6 - Breeding program using artificial insemination

7 - Molecular information

Sheep and goat in ICAR countries: number of animal in official milk recording



- **~900K sheep & 460K goats** of which 86% (sheep) and 88% (goats) in 3 countries (France, Spain and Italy).
- **9% of sheep and 10% of goats are recorded** (official milk recording)
- In addition to official milk recording, France has ~550K dairy sheep in D method

- Relative stability of recorded animals over time

Importance of simplified recording methods

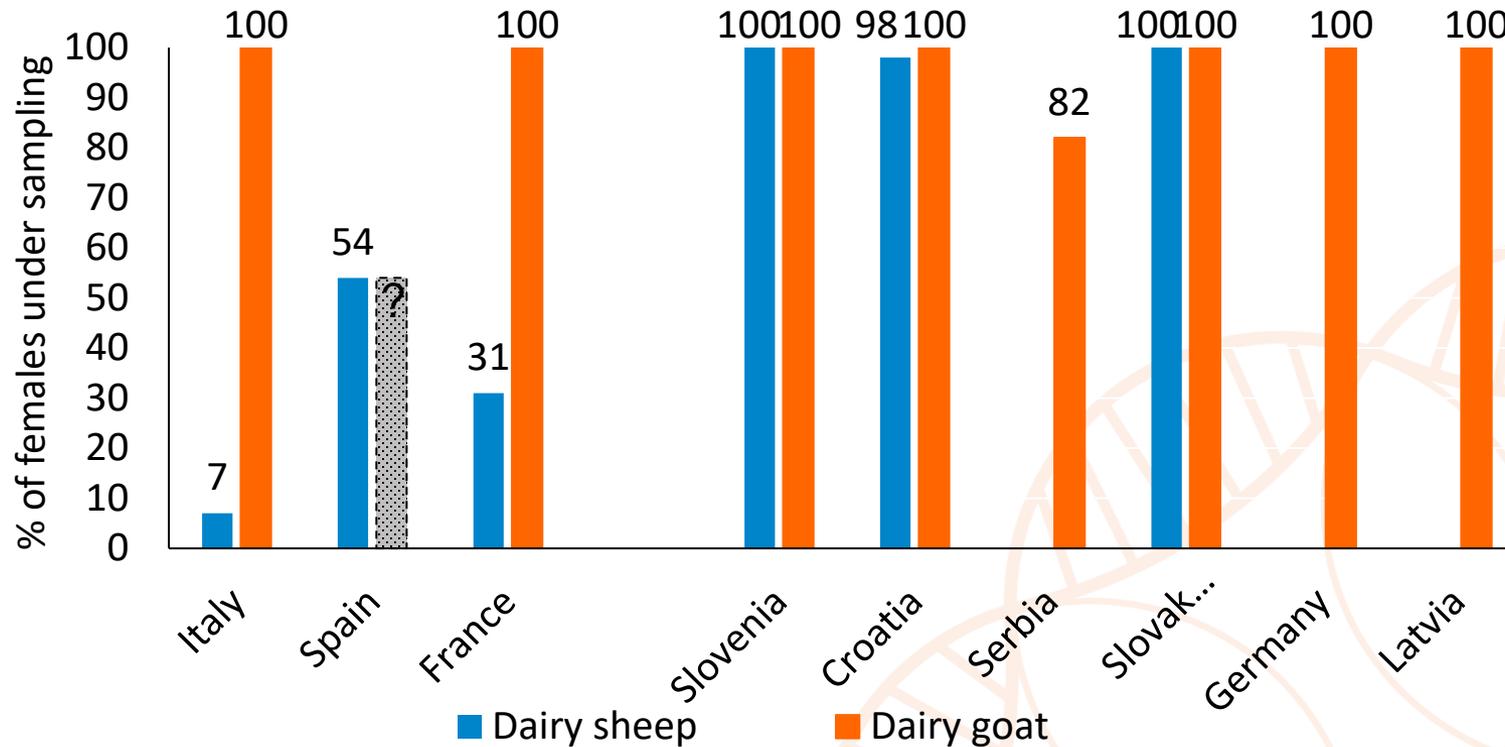
	Goat	Sheep
Italy	AT	AT - AC (Sarda)
France	A4,AY,AZ,CY,CZ – AT - AC	AC - B
Spain	A4 - AT - AC	AT – AC (Latxa-part)
Portugal	A4(most) - AT	A4(most) - AT
Slovenia	AT	AT
Croatia	AT(most) - A4	AT(most) - B4
Serbia	AT	
Czech Rep.	AC - E	AT
Slovak Rep.	AC	AC
Latvia	A4	

Simplified methods (one recorded milking per day) highly recommended

Estimation:
98% sheep in (AT,AC)
58% goats in (AT,AC)

D method used in France in commercial flocks (sheep)

Use of qualitative recording (optional recording)



- Qualitative recording is globally generalised in goats
- Qualitative recording is partial in French, Spanish and Italian dairy sheep

Why such a situation?

- Large flocks/herds size (300-500 animals) => **expensive**: high cost of analyses + additional technician required
- High speed of the milking routine (see video – 2-3 minutes per ewe/doe) => **time consuming**: additional technician required for sampling (≥ 2)



- Necessary to rationalize (cost-benefit for breeding program efficiency)

Simplification of (qualitative) milk recording

1. Milk quality = optional disposition in the guidelines
2. Reduce part of animals sampled within farm (e.g. parities 1 (& 2))
3. Part-lactation sampling within AC method : *implemented in sheep, in France, Italy and Spain*

Suckling

AC method : record of 1 of the 2 milkings

Test-day

X

X

X

X

X

X

A4 method, all ewes

For 100 ewes : 100 x 6 TD x 2 milkings = **1200 samplings**

**Part-lactation
sampling within AC
method, parity 1**

For 100 ewes : 35 x 3 TD x 1 milking = **105 samplings (9%)**

**1 ewe : 2 to 6 samplings in its
productive life**

What are the consequences?

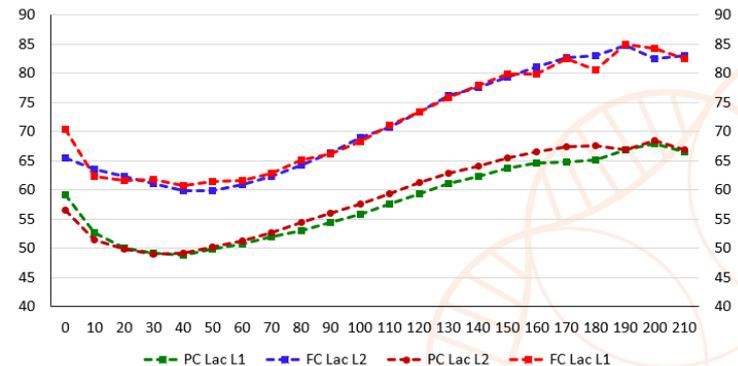
- Few measures of content in an animal lifetime. Between 2 and 6 measures.
- Genetic progress depends on the accuracy of the EBVs
- Heritability of contents is lower in a part-sampling design (especially for fat [0.50 => 0.35])
- It is economically unthinkable (on large size populations) to increase the number of measures
- It highlights the expectation that each measure be precise enough. Relaxing the precision of an individual measure = decreasing the efficiency of selection (not expected from the geneticist point of view)
- Devices must be accurate and sampling must be accurately representative of the milking.

But small ruminant milk (and especially sheep milk) has “unfavourable” specificities regarding the devices

- Sheep milk **components are high**
 - FC ~0.7-0.75 up to 130-140
 - PC ~0.5-0.55 up to 100-110
- **High viscosity**
- **Foam**
- **Small quantity of milk** in sheep (500 ml – 3000 ml) => sampling is more difficult

All these characteristics make the recording of yield, and above all the sampling, more difficult to realise with accuracy.

Lactation curves of Lacaune dairy sheep FC and PC (parities 1 and 2)



Limits of error for milk yield and fat (TO-DAY)

Table 3. Limits of error for milk yield and fat percentage per species for milk recording devices with a sampler (both test day recording and daily recording).

Species	Milk yield			Fat percentage		
	Range	Standard deviation ¹	Bias ²	Range	Standard deviation	Bias
Cattle	2 - 10 kg	0.50 kg	0.2 kg	2 - 8 %	0.10 % fat	0.05 % fat
	> 10 kg	5 %	2 %			
Buffalo	1 - 6 kg	0.30 kg	0.12 kg	3 - 15 %	0.30 % fat	0.10 % fat
	> 6 kg	5 %	2 %			
Goat	0.3 - 0.8 kg	0.04 kg	0.025 kg	2 - 12 %	0.20 % fat	0.10 % fat
	> 0.8 kg	5 %	3 %			
Sheep	0.3 - 0.8 kg	0.04 kg	0.025 kg	2 - 12 %	0.30 % fat	0.10 % fat
	> 0.8 kg	5 %	3 %			

¹In kg or in percentage of mean reference yield.

²In kg or in percentage of the reference yield.

- Most of the limits are higher in sheep/goat than in cattle

1.5 time the cattle limit

3 times the cattle limit
(change in 2022)

Twice the cattle limit

Large variety of milk recording devices

Countries	Goat		Sheep	
	(portable) Jars	Meters	(portable) Jars	Meters
France		Tru-Test Lactocorder WMB Few MM25SG (<5)	Gély (~3,000)	Lactocorder WMB (<5) MM25SG (<5)
Italy		EMM 5%	MIBO GIRO TECH	EMM 5%
Spain	Esneder	Tru-Test, DeLaval	Berango (model Esneder) MIBO (model lattometri) Gruponor	DeLaval MM25SG Westfalia, Afikim, Flaco, GEA
Croatia		Waikato MK4		Waikato MK4
Czech		Tru-Test (Mini)		Tru-Test (Mini)
Slovak	Fisher Slovakia	Tru-Test	Fisher Slovakia Berango / milkovis	
Portugal	Westfalia, Vitlab	Sneder Mayfra, Tru-Test		Tru-Test, Flaco
Slovenia		Waikato, Tru-Test		Tru-Test

- Mostly portable jars (meters) approved through the exception status (especially in sheep)
- Still few on-farm electronic milk meters (except in Spain)

Conclusion and perspectives

- Development of milk recording in large populations of sheep and goats is possible with simplified recording designs
- Sampling operation is a key concern for expanding milk recording in sheep and goat.
- Getting good accuracy in recording yield and sampling milk is a challenge for the devices.
- Limits are relaxed, compared to cattle, and are separate across sheep and goat.
- Most of the devices used are jars “agreed” through the exception status
- Friendly sampling devices could stimulate the market

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Thank you for your attention!



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Milk recording in a Lacaune dairy sheep farm

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Control Laitier_ICAR_v2 Thursday, May 25, 2023 - 14:00-17:30

