Towards ICAR guidelines on conformation traits in dairy sheep recording

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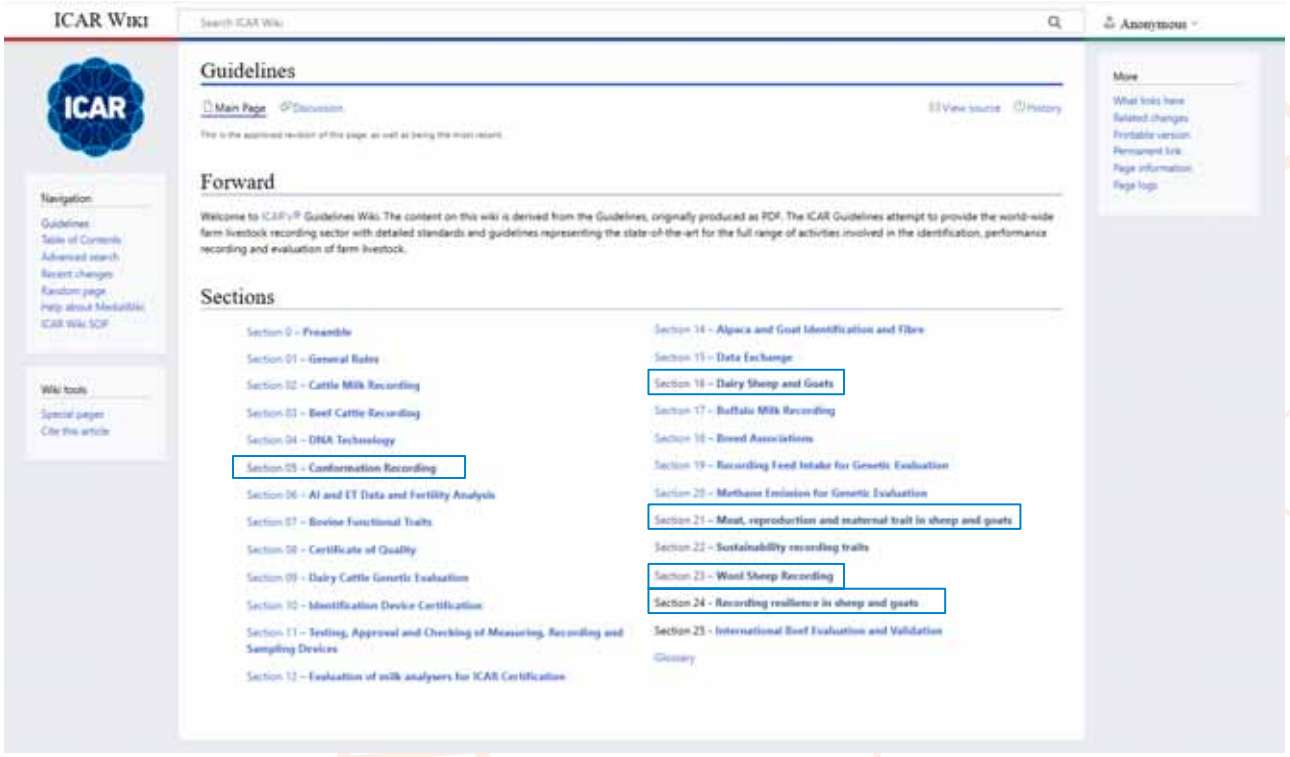
Background

- ICAR Sheep, Goats and Camelids Working Group
- Guidelines



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Section 05 – Conformation Recording

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Why is conformation important?

- **Relevant indicators**
  - Health, metabolic efficiency, disease resistance, reproduction ability and functional longevity
  - Favourable conformation positively affects the length of productive life
- **Dairy breeds**
  - Udder conformation
    - Proper structure directly affects milk production and resistance to mammary gland diseases
    - Improve machine milkability

Mediterranean breeding area

Objectives

- To document the **existing variety** of conformation traits scored
- To establish a path toward **their international harmonization**
- To develop the **ICAR conformation recording guidelines in dairy sheep**

Survey

- Main parts of Survey
  - Country – Organisation
  - Size
    - Dairy sheep population, population included in conformation recording
  - Breeds involved
  - Details of scored population (gender, age at scoring, number of scorings, number of classifiers)
  - **List of recorded conformation traits**
    - **Frame, legs, udder**
  - Genetic evaluation

Mediterranean breeding organizations

8 respondents from 7 countries

Collected informations

https://www.imdb.com/title/tt2872750/

Size of the dairy sheep population and breeds involved

Country	Size of dairy population	Breed				
Croatia	7,002	Istrian sheep	Pag sheep	Lacaune	East Friesian	
Cyprus	59,400	Local Cyprus Chios sheep				
Greece		Chios				
France	1.5 M ewes, 340 K ewes in selection	Lacaune	Manech tête rousse	Manech tête noire	Basco-Béarnaise	Corse breeds
Slovenia	5,000	Bovec sheep	Improved Bovec sheep	Istrian Pramenka		
Spain	85,844 (Churra), 261,000 (Latxa Cara Rubia and Latxa Cara Negra), 1.7M ewes, among them 150K ewes in selection (Manchega), 458,852 (18,870 sires, of which 1,001 were AI males, Assaf)	Churra	Latxa Cara Rubia Latxa Cara Negra	Manchega	Assaf	

Size of the population in conformation recording and breeds involved

Country	Size of the population in conformation recording	Breed				
Croatia	65	Istrian sheep	Pag sheep	Lacaune	East Friesian	
Cyprus	No sheep breed involved in recent conformation recording, but need for udder trait improvement is evident	Local Cyprus Chios sheep				
Greece	Chios breeders on the need to procced on udder conformation scoring	Chios				
France	70 K ewes scored for udder, around 2,500 rams scored for legs and frame	Lacaune	Manech tête rousse	Manech tête noire	Basco-Béarnaise	Corse breeds
Slovenia	30	Bovec sheep	Improved Bovec sheep	Istrian Pramenka		
Spain	59,392 (Churra) No conformation recording is implemented (Latxa Cara Rubia and Latxa Cara Negra) 350K ewes for udder and 3000 rams (Manchega) 463,300 (Assaf)	Churra	Latxa Cara Rubia Latxa Cara Negra	Manchega	Assaf	

Genetic evaluation

Country	Genetic evaluation	Breed	Traits	Model	Method
Croatia	No				
Cyprus	No				
Greece	No				
France	Yes		Udder Frame Legs	Fixed effects: classifier, interval milking-scoring, stage of lactation, flock x year, parity (Corse) Fixed effects for legs and frame: classifier, flock x year, age	**GBLUP**
Slovenia	No				
Spain	Yes	Churra	Udder Global Shape General Body Score	Fixed effects: Herd Test-day, Ewe lamb order, ewe age at lambing (in months), number of lambs born alive in the prev. lactation, L120 - standardized milk yield in the prev. lactation, week in lactation (2-34) Random effects: animal genetic and permanent environmental effect	**BLUP**
		Latxa Cara Rubia Latxa Cara Negra	Udder depth and attachment Teat length and verticality	Fixed effects: Flock-year-assessor, age-parity number, stage of lactation, and milk yield produced on the day of scoring as a covariable are included Random effects: additive genetic with unknown parent groups is considered as	**GBLUP**
		Manchega	Teat Placement Udder Cleft Udder Depth Udder Attachment	Classifier, milk production level close to the day of udder recording, stage of lactation, flock x year, parity	**GBLUP**
		Assaf	Udder insertion and depth Teat verticality and size General conformation	Animal model with repeated measures, Fixed effects: comparison group (herd, year and month of calving), type of calving, number of lactations and two covariates, lactation status (days between the calving date and the date of qualification) and milk production (value of the milk control) closest to the date of qualification	**ssGBLUP**

Feedback for **frame** traits

Country	Loin strength	Shoulder width	Stature	Rump width	Rumph angle	General body score	Body length	Body depth	Chest depth	Chest width	Angularity
Croatia	No	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Cyprus	No	No	No	No	No	No	No	No	No	No	No
Greece	No	No	No	No	No	No	No	No	No	No	No
France	Yes	Yes	No	No	No	No	No	No	No	No	No
Slovenia	Yes	No	No	No	Yes	No	Yes	No	Yes	Yes	No
Spain	No	No	Yes	Yes	No	Yes	No	No	No	No	No
	No	No	No	No	No	No	No	No	No	No	No
	No	No	No	No	No	No	No	No	No	No	No
	No	No	No	No	No	No	No	No	No	No	No

Feedback for **leg** traits

Country	Hock	Front pasterns side view	Front legs side view	Rear legs rear view	Rear legs side view	Front legs front view	Hock development	Feet orientation
Croatia	No	No	No	No	Yes	Yes	No	Yes
Cyprus	No	No	No	No	No	No	No	No
Greece	No	No	No	No	No	No	No	No
France	Yes	Yes	Yes	No	No	No	No	No
Slovenia	No	No	No	No	Yes	Yes	Yes	Yes
Spain	No	No	No	Yes	No	No	No	Yes
	No	No	No	No	No	No	No	No
	No	No	No	No	No	No	No	No
	No	No	No	No	No	No	No	No

Feedback for **udder** traits

Country	Teat Angle	Teat Position	Teat length	Udder Cleft	Udder Depth	Udder Attachment	Udder global shape	Udder insertion and depth	General conformation
Croatia	No	No	No	No	No	No	No	No	No
Cyprus	No	No	No	No	No	No	No	No	No
Greece	No	No	No	No	No	No	No	No	No
France	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Slovenia	No	No	No	No	No	No	No	No	No
Spain	No	Yes	Yes	No	Yes	Yes	Yes	No	No
	No	No	Yes	No	Yes	Yes	No	No	No
	No	Yes	No	Yes	Yes	Yes	No	No	No
	No	Yes	Yes	No	No	No	No	Yes	Yes

To summarize…

https://www.imdb.com/title/tt2872750/

The most frequently recorded traits

- **Frame (5)**
  - Loin strength, rump angle, rump width, body length, chest width
- **Leg (6)**
  - Front legs set front view, front legs set side view, rear legs rear view, rear legs side view, feet orientation, front pasterns side view
- **Udder (5)**
  - Teat orientation rear view, teat length, udder depth, fore udder attachment, udder cleft (central ligament)

What to do with collected Survey results?

- Described by wording and drawing
- Soon available in the **Section 5 - Conformation Recording**

- Crucial foundation for the **international harmonization** of conformation recording
- More **precise selection** for functional longevity, machine milkability, and udder health

Future work / International initiative

- Short term
  - Advisory group with expertise in the field of conformation classification, statistics, and training people
  - Monitor and advise the improvement of the classification system
- Long Term
  - International framework for the genetic evaluation of dairy sheep
  - Share of genotypes / panel of SNPs (parentage verification or genomic selection)
  - European Reference Centre - exchange in small ruminant (phenotyping, genetic evaluation, valorisation of genotypings)

Acknowledgement

- Conformation recording group
  - Gerben De Jong, Tamas Sebok
- Ante Kasap
- Jean-Michel Astruc

Thank you for your attention!