Genotyping and Phenotyping of new Health Traits in selected herds of Spanish Dairy Cattle: Project I-SA

N. Charfeddine[1], J. Blanco[2] & M. A. Pérez-Cabal[3]

[1] CONAFE, Spanish Holstein Association, 28340 Valdemoro, Spain

[2]Department of Medicine and Animal Surgery, Complutense University of Madrid, 28040 Madrid, Spain

[3] Department of Animal Production, Complutense University of Madrid, 28040 Madrid, Spain

Email: nouredine.charfeddine@conafe.com

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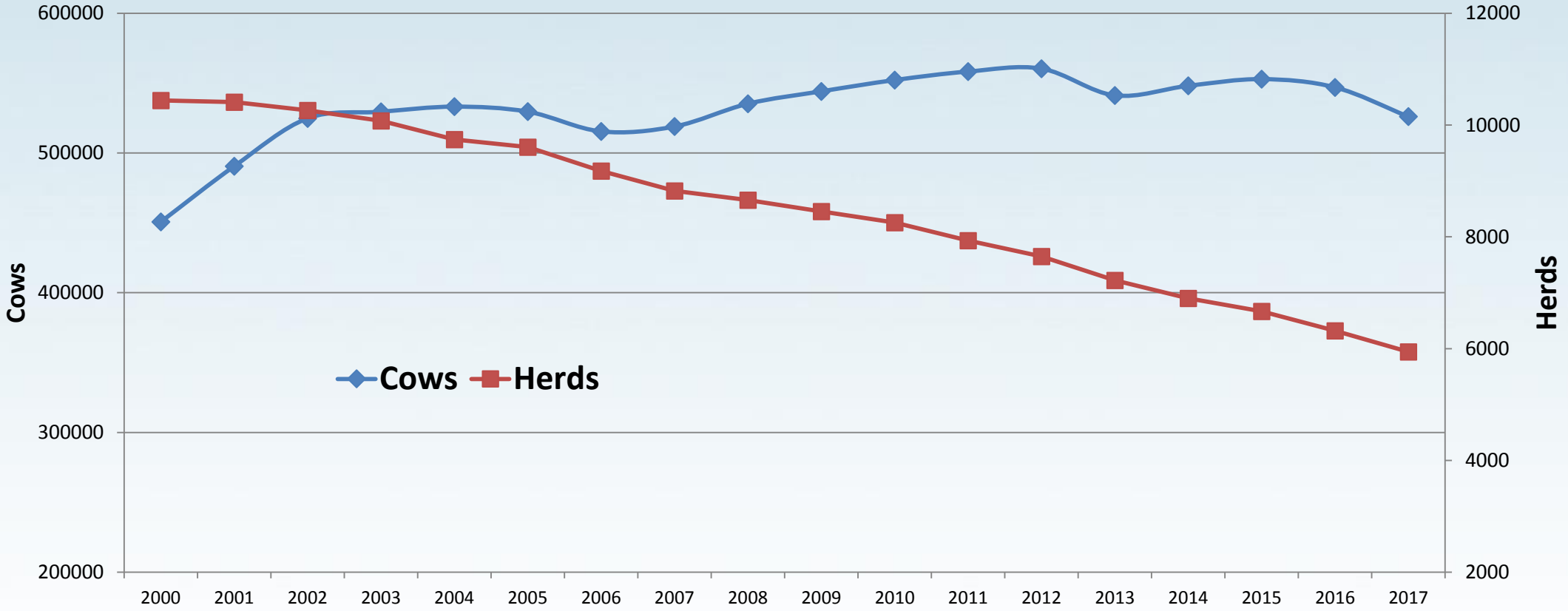
Background

- Milk recording and Type classification have been the conventional sources of information

Milk recording in Spain has been experiencing a steady decline of Herds for the past two decades



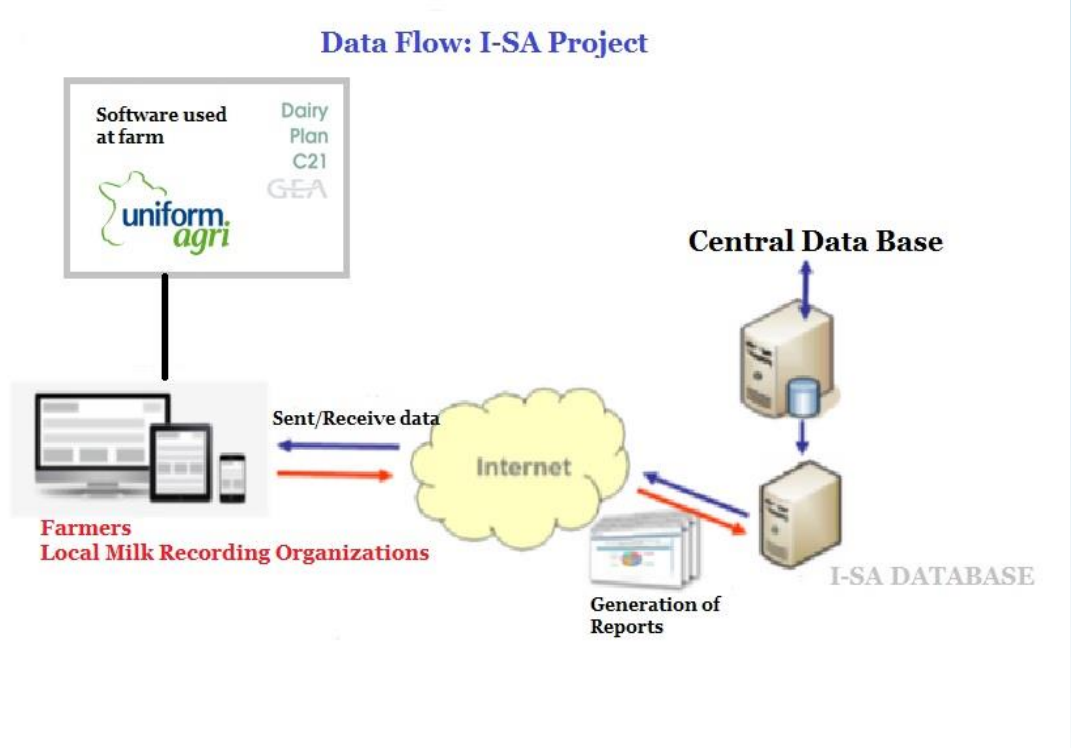
Background

- Milk recording and Type classification have been the conventional source of breeding values
- Genomic Evaluation started in 2012
- Recording new phenotypes and female genotyping become a real need in genomic Era
- 2012 I-SAP Claw health recording program started

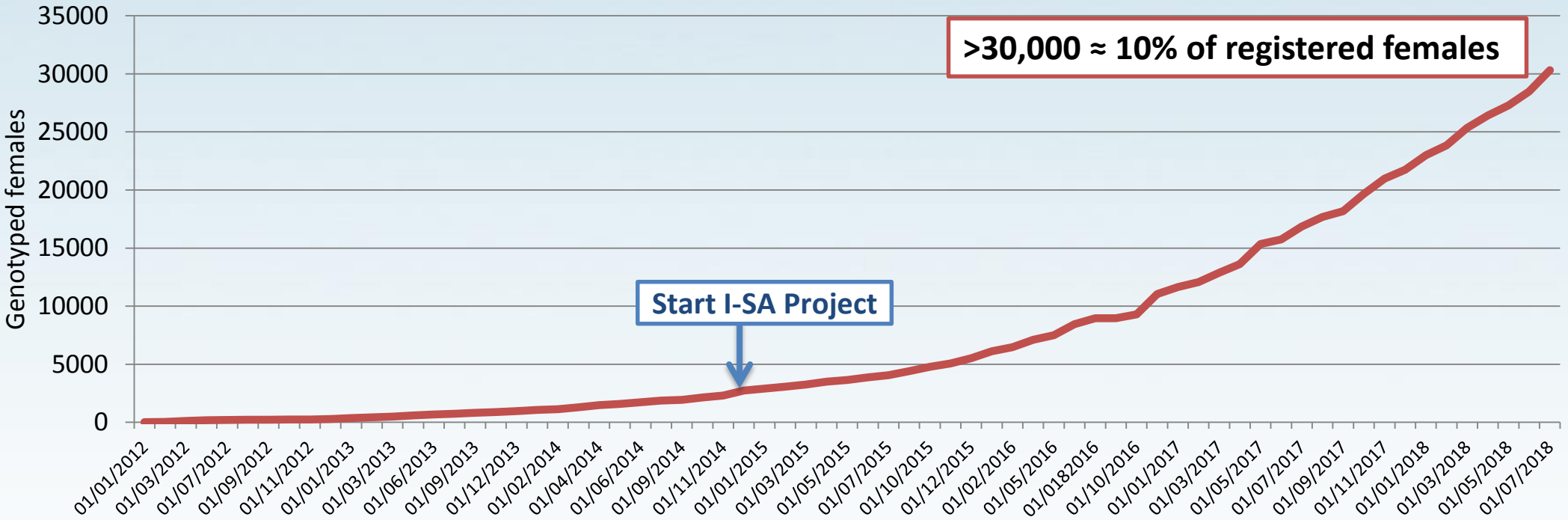
CONAFE

I-SA Project: Information on Animal Health

- CONAFE-UCM set up the project in 2015.
- A standardized key for health recording was developed.
- Data are recorded by farmers and sent online by local milk recording organization or farmers to I-SA database.
- Data recording started: **1st Jan 2016**
- Project pays the genotype of all cows in the herd and makes a discount for the genotype of female calves.



Female Genotyping



Herds Selection

- Interest shown in genotyping

- Availability of extra information
  - Claw health disorders
  - Milk flow
  - BHB

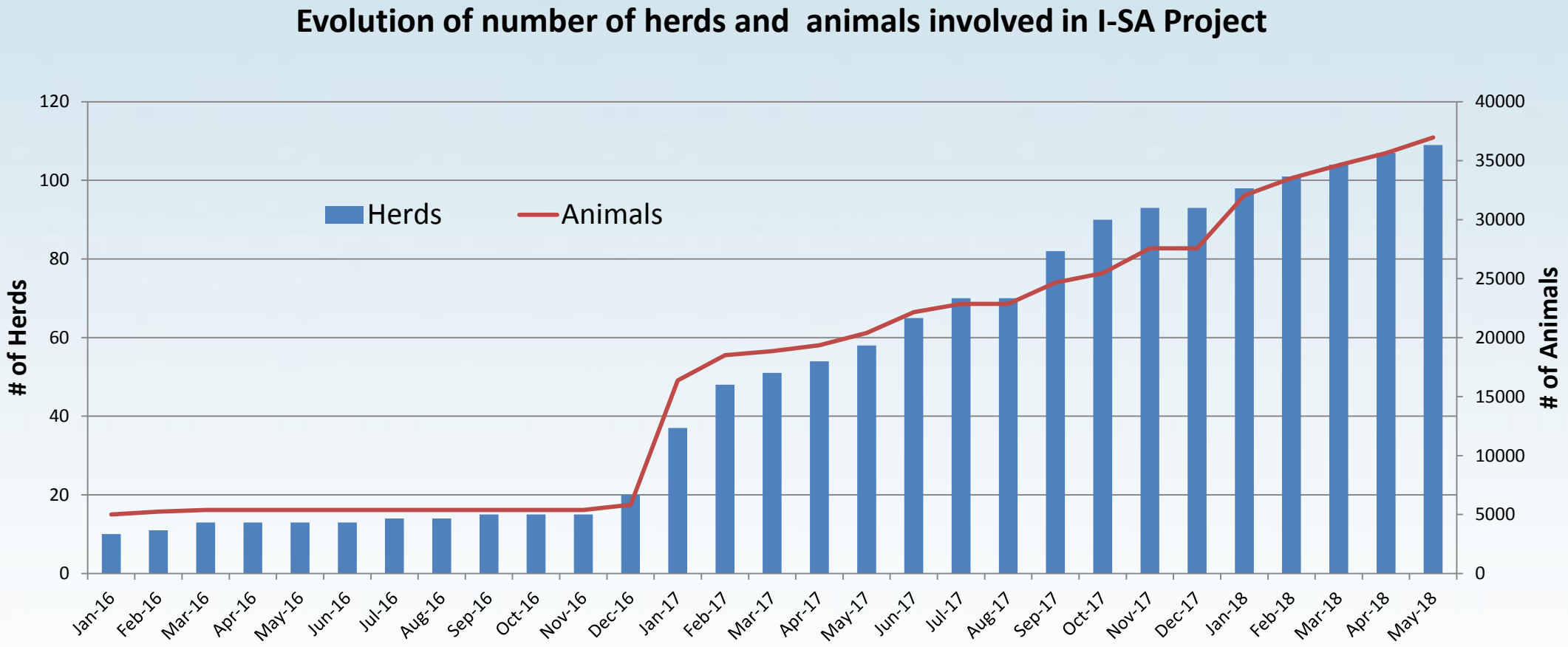
- Low rate of mistakes in pedigree

Traits

List of Recorded Health Disorders	
1	Clinical Mastitis
2	Subclinical Ketosis (BHB)
3	Clinical Ketosis
4	Milk Fever
5	Displaced Abomasum
6	Lameness
7	Metritis
8	Retained Placenta
9	Abortions
10	Embryonic Death
11	Ovarian Disorders
12	Pneumonia

Compulsory disorders

Data Recorded

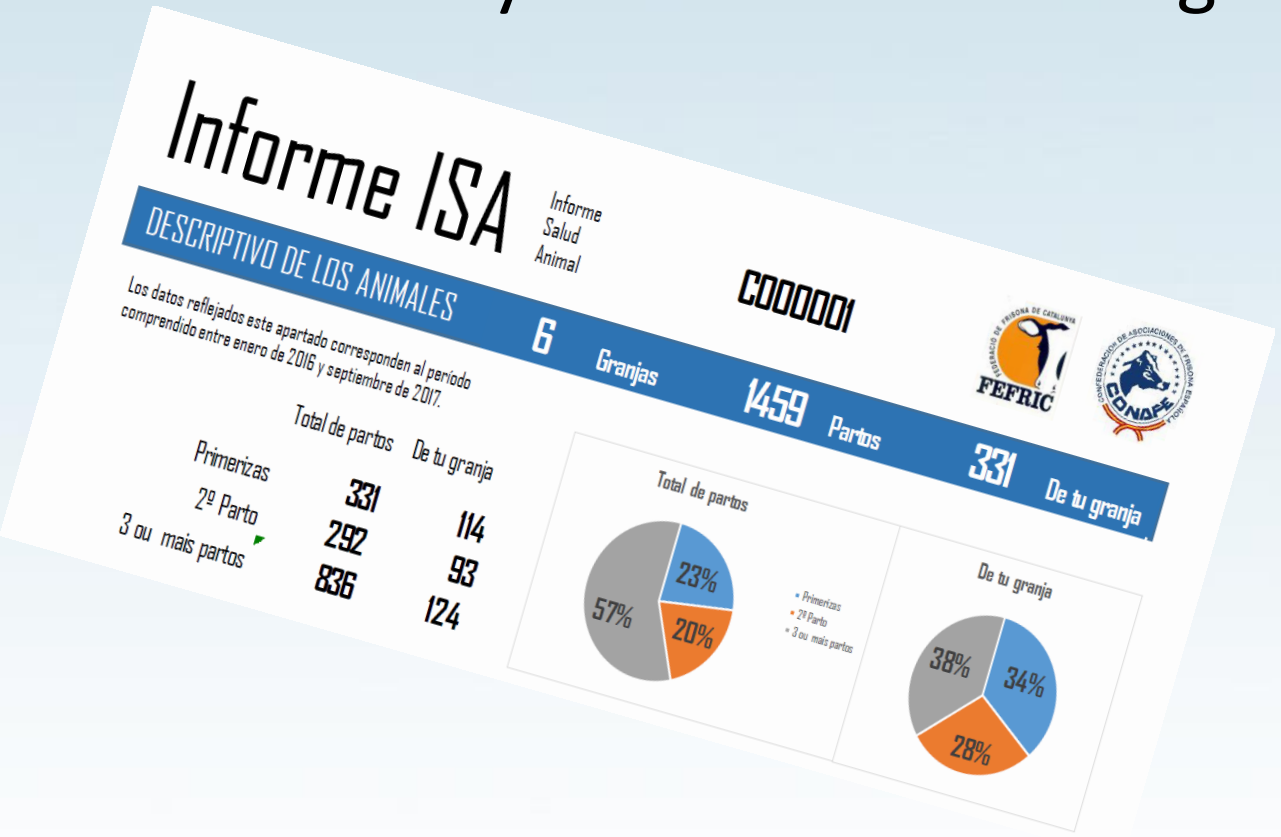


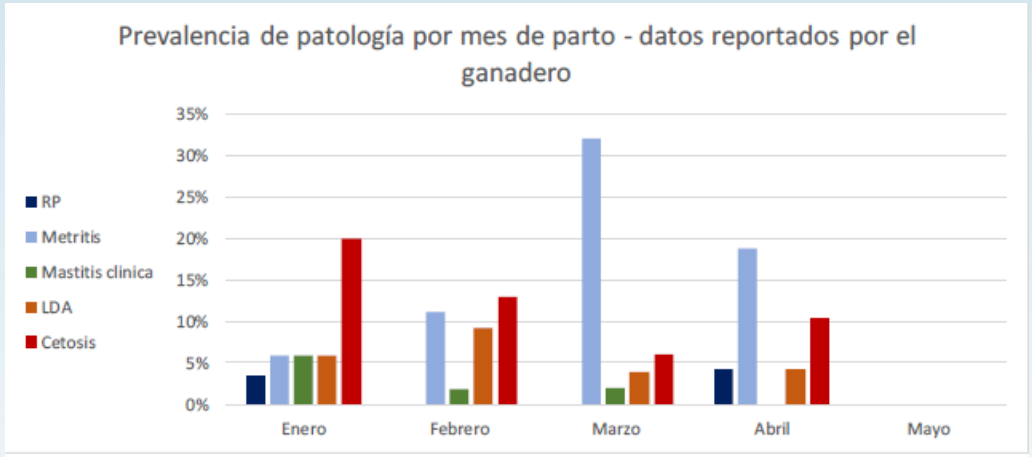
Incidence

	Lactation incidence rate (%)	Incidence rate at day 68 (%)
Clinical Mastitis	15.3	5.0
Subclinical Ketosis (BHB)		14.3
Clinical Ketosis	1.9	1.6
Milk Fever	0.6	0.5
Displaced Abomasum	2.6	1.9
Lameness	15.0	2.8
Metritis		7.9
Retained Placenta		7.7
Abortions	1.9	
Embryonic Death	1.8	
Ovarian Disorders	6.1	
Pneumonia	3.0	

Feedback

- Twice a year a Benchmarking report





Genetic Parameters

- Heritabilities and repeatabilities on the observed scale

Health Disorders at day 68 of lactation		
Health Disorders	**Heritability (s.e.)**	**Repeatability (s.e.)**
Clinical Mastitis	0.011 (0.006)	0.18 (0.006)
Subclinical Ketosis (BHB)	0.037 (0.016)	0.032 (0.016)
Displaced Abomasum	0.017 (0.007)	0.011 (0.007)
Retained Placenta	0.023 (0.006)	0.088 (0.023)
Metritis	0.016 (0.006)	0.031 (0.007)

Economic Cost

- Cow reference population: 20,000 genotyped cows with valid phenotypes in several lactations.
- Estimated total cost for genotyping and phenotyping: **900,000 €.**
- To be paid over a period of time of 5 years.

Conclusions and next steps

- New phenotypes are the keys for making the difference in the genomic Era
- Genotyping of cows is the way to build a reference population for new health traits
- Working with compromised herds is the way to reduce economic costs and improve data quality
- Next steps: To extend the number of herds up to 200

Acknowledgements

- All farmers engaged in I-SA Project
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