Using test-day models for the estimation of breeding values for milk quality traits in Latxa sheep breed

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Introduction

- Latxa breeding program: EBV
  - Milk yield
  - Milk composition (fat and protein content)
- Milk yield
  - Total milking flock
  - All flocks
- Milk composition traits
  - Flocks with AC method
  - No samples at the beginning/ end of lactation
  - First and second parities
  - No all animals are evaluated

Introduction

- Moreover
  - Low heretabilities for fat content
  - Changes in genetic evaluations from year to year
  - Lactational models: average values
  - To assure good estimations: requirements
    - distribution into the lactation
    - number of controls
- As consequence: 30% of controlled lactations are refused
- Alternative: Use of test-day models
  - Use of total recorded controls

Objective

- To analyze if the use of test-day models
  - Higher technical returns
    - higher number of animals (males and females)
  - Changes genetic evaluations
  - Changes in ranking

Material and methods

- First study
- Data proceeding of milk recording program 2008-2009
- Latxa Black faced of Navarra
- 974 first parity ewes
- 2574 milk composition records; 3475 milk yield records

Material and methods

- BLUP methodology (PEST)
- Animal models; Univariate models (milk composition)
- Lactational model

$$Y_{ijklmn} = \mu + HYM_i + A_j + NLL_k + ILFC_l + a_m + e_{ijklm}$$

- Test-day model

$$Y_{ijklmn} = \mu + HCD_i + A_j + NLL_k + ILCd_l + pe_m + a_n + e_{ijklmn}$$

Material and methods: h^2 (r)

	Fat %	Protein %
Lactational model	0.14	0.38
Test-day model	0.10 (0.23)	0.30 (0.35)

Material and methods

- Number of evaluated animals
- Pearson and Spearman correlations
  - Male/females
  - AI males
- Effect fixed estimations

Results : technical report

	Lactational model	Test-day model
Evaluated animals (alive)	28855 (8570)	29827 (8837)
Nº evaluated males	425	425
Nº evaluated females	8145	8412

Results : correlations

	Pearson		Spearman	
	Fat %	Protein %	Fat %	Protein %
Females with data	0.74	0.69	0.73	0.73
AI Males	0.86	0.83	0.77	0.77

Results : fixed effects

		Lactational		Test-day	
		Fat %	Protein %	Fat %	Protein %
A	1	0	0	0	0
	2	-0.06	0.04	-0.09	0.03
NLL	0	0	0	0	0
	1	-0.3	-0.2	-0.2	-0.2
	2	-0.2	-0.1	-0.15	-0.1

Summary

- Higher number of data
  - same number of males
- Similar estimations of fixed effects
- Low correlations

- Very conditioned by low number of data

So

- We don’t have clear answer
- Are improving the model
  - All parities
  - Multivariate models
  - To combine different genetic evaluations
- New definition of objective selection
- Genetic evaluations for milk yield?
- Genomic selection?

THANK YOU