

# Phenotypic and genetic correlations between milk yield and type traits for Holstein cattle in Croatia

Špehar M.<sup>1</sup>, Štepec M.<sup>2</sup>, Lučić M.<sup>1</sup>, Ivkić Z.<sup>1</sup>

<sup>1</sup>*Croatian Agricultural Agency, Ilica 101, 10000 Zagreb, Croatia*

<sup>2</sup>*University of Ljubljana, Biotechnical faculty, Department of Animal Science, Groblje 3, 1230 Domžale, Slovenia*

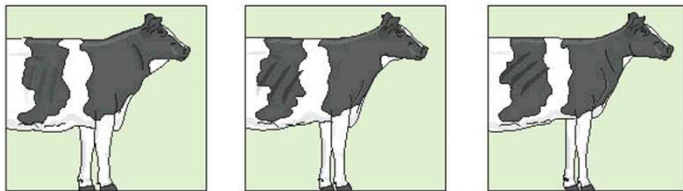
# Introduction

- Associations between milk production and type traits
- Great economic importance
  - To obtain high milk production from healthy, fertile cows
  - To reduce production costs (veterinary care and medications)
  - To increase the productive life of cows in the herd

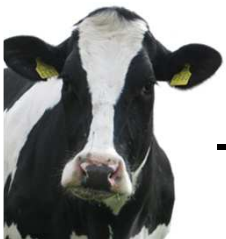
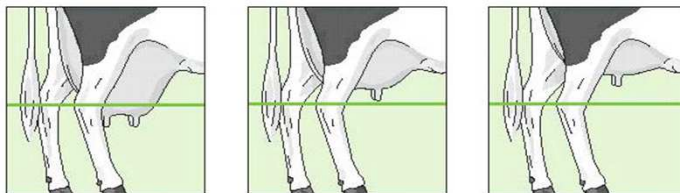


# Objective

- To estimate phenotypic and genetic parameters
  - Milk yield (MY)
  - Type traits
    - angularity – AN



udder depth – UD



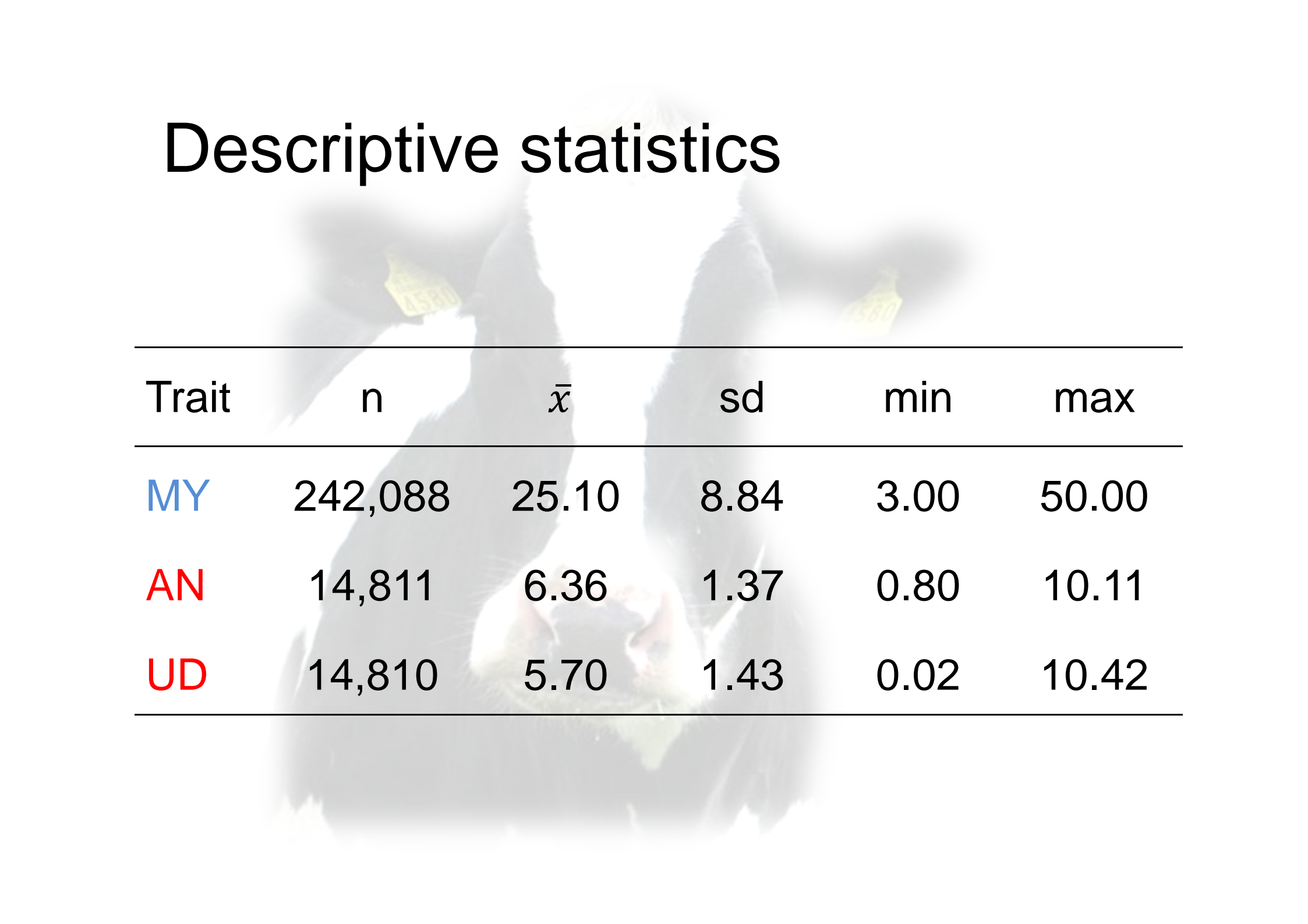
- First lactating Holstein cows

# Material

- Central database of Croatian Agricultural Agency
- Calvings from 2004 to 2015
- **Records**
  - Test-day → 242,088
  - Type → 14,811
- **Pedigree**
  - 46,660



# Descriptive statistics



Trait	n	$\bar{x}$	sd	min	max
MY	242,088	25.10	8.84	3.00	50.00
AN	14,811	6.36	1.37	0.80	10.11
UD	14,810	5.70	1.43	0.02	10.42

# Pedigree structure

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Animals with phenotypic records	14,811
Non-base animals	45,367
-both parents known	30,359
-only sire known	12,668
-only dam known	2,340
Base animals	1,293
Proportion of base animals (%)	3
<hr/> Total number of animals	<hr/> 46,660

# Method

- Data preparation
  - SQL (SAS/STAT)
  - Phenotypic correlations
- Bivariate animal model
- Variance components estimation (VCE-6)



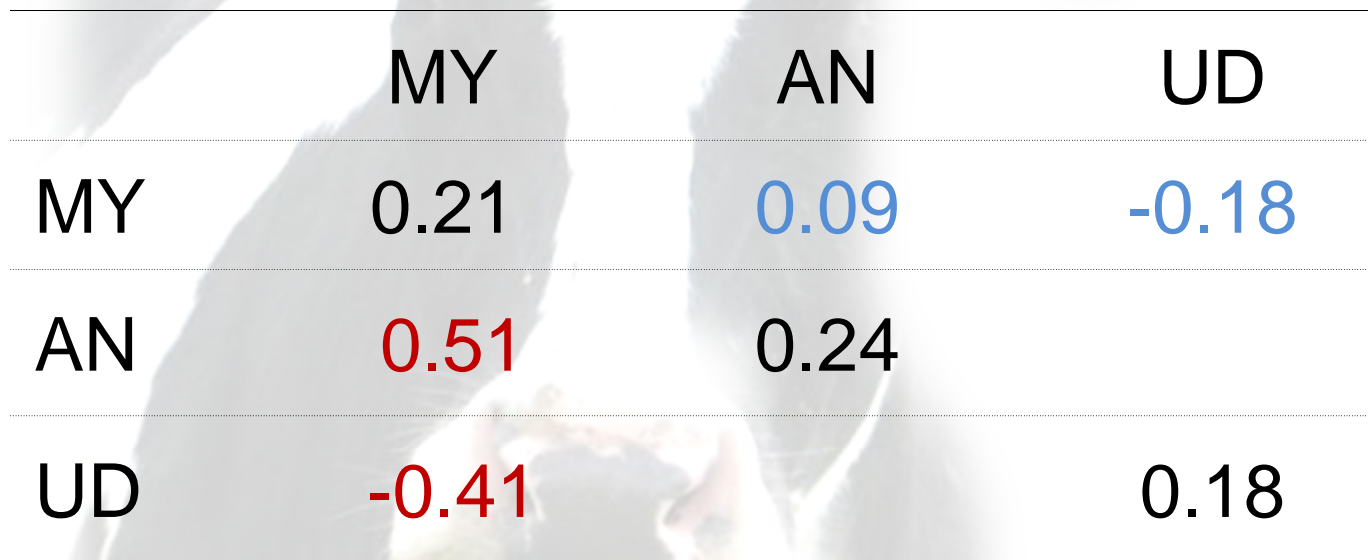
# Models

Effect / Trait	MY	AN, UD
<b><u>Fixed</u></b>		
Calving season	+	
Region	+	
Ali / Schaeffer lact. curve nested within parity	+	
Age at first calving	QR*	+
Age at scoring		+
Scoring season		+
Classifier		+
Time after milking		+
<b><u>Random</u></b>		
Additive genetic effect	+	+
Permanent environment	+	
Contemporary group (Herd-year of testing)	+	



# Variance ratio and correlations

- phenotypic and genetic



	MY	AN	UD
MY	0.21	0.09	-0.18
AN	0.51	0.24	
UD	-0.41		0.18

# Conclusions

- Results indicate that higher yielding cows are more angular
- High udders are genetically associated with small volumes and lower production
- Genetic antagonism observed between MY and UD **should be considered** to avoid deterioration of these or correlated traits

