Genetic parameters for somatic cell score in Croatian Holstein cattle
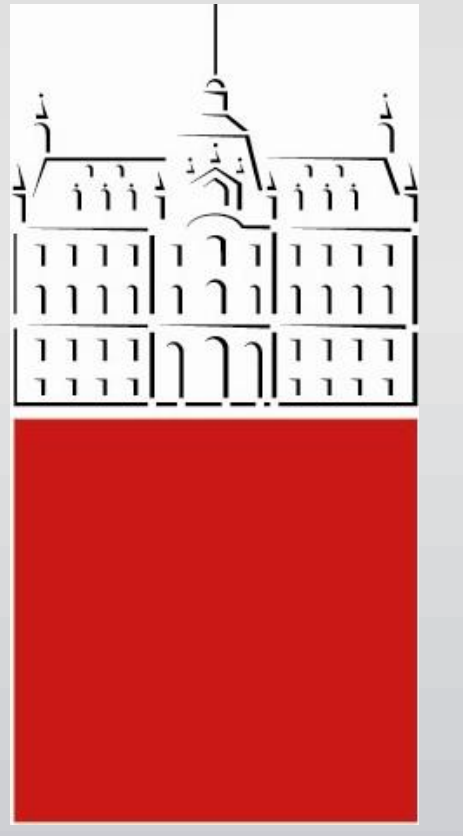
Špehar M.[1], Ivkić Z.[1], Gorjanc G. [2], Bulić V.[1], Mijić P.[3], Barać Z.[1]

[1]Croatian Agricultural Agency, Ilica 101, 10000 Zagreb, Croatia, e-mail: mspehar@hpa.hr
[2]University of Ljubljana, Biotechnical Faculty, Department of Animal Science, Groblje 3, 1230 Domžale, Slovenia
[3]University of J.J. Strossmayer in Osijek, Faculty of Agriculture, Trg Sv. Trojstva 3, 31 000 Osijek,Croatia

University of Ljubljana
Biotechnical Faculty

Introduction

• Somatic cell score **(SCS)** is an important indicator of udder health and the prevalence of clinical and subclinical mastitis in dairy herds

• The objective of this study was to estimate genetic parameters for **SCS** in Croatian Holstein cattle

Conclusions

• Estimated heritability was comparable to the estimates in countries that use fixed regression test-day models

• Results provide genetic parameters for the application of genetic evaluation for somatic cell score in Croatian Holstein cattle

Material

• Number of test-day records: 656,272 for 45,953 Holstein cows
• Number of animals in pedigree: 94,294
• Central database of the Croatian Agricultural Agency
• Logarithmic transformation for **SCS** was performed (in order to obtain a normal distribution)
  $logSCS=log_2(SCS/100.000)+3$

Results

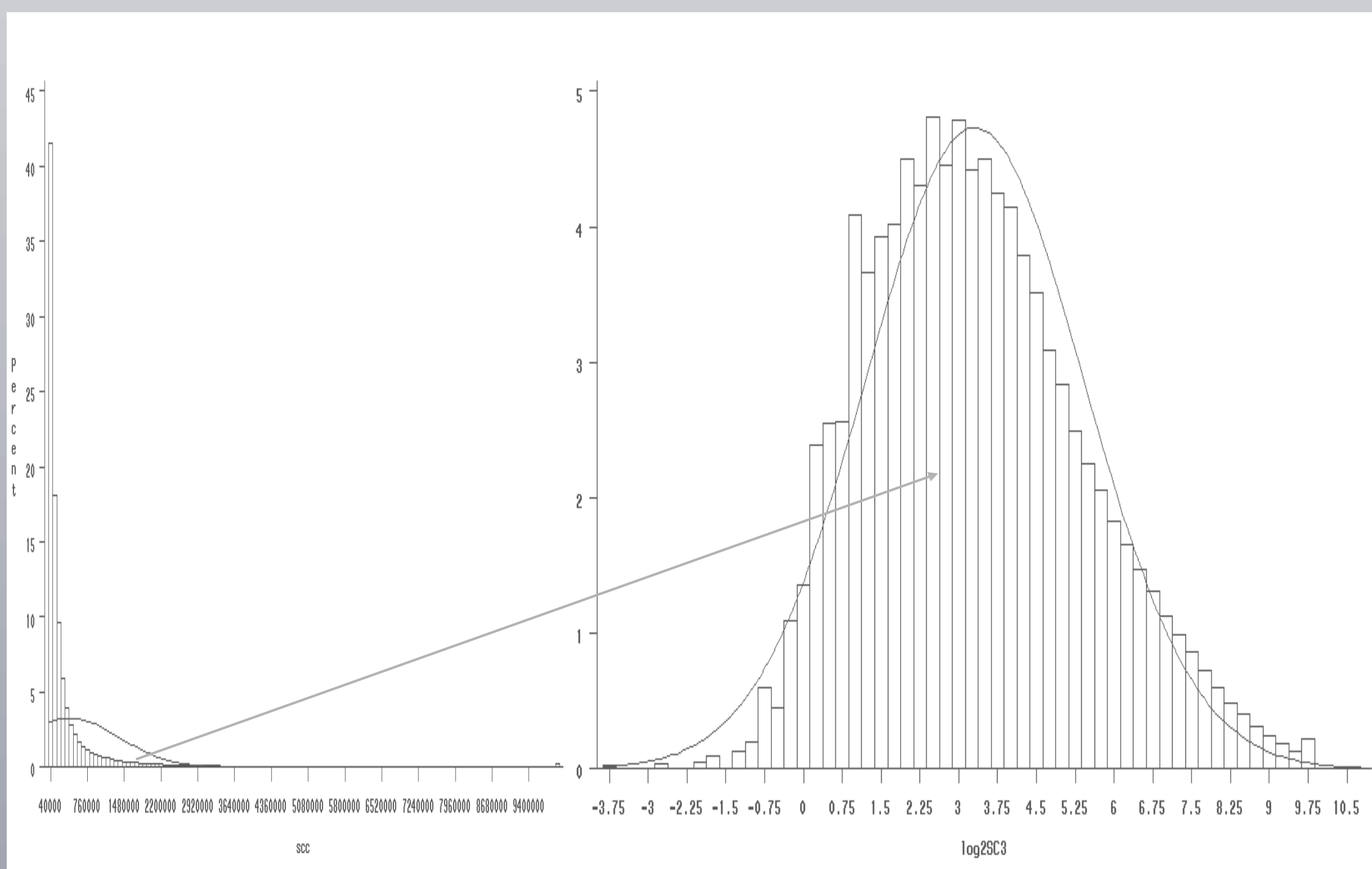• Descriptive statistics for SCS and log SCS

Trait	$\bar{x}$	σ	Min	Max
SCS	406×10^3	970×10^3	1×10^3	19871×10^3
logSCS	3,3	2,1	-3.6	10.6

• Variance components - REML method (VCE-6)

h^2	hy^2	p^2	e^2
0.182±0.002	0.068±0.001	0.203±0.002	0.544±0.002

h^2 - heritability, hy^2 - ratio for herd-year of test-day, p^2 - ratio for permanent environment, e^2 - ratio for residual

Method

• Single-trait repeatability fixed regression test-day model

$$y = Xb + Z_{hy}hy + Z_a a + Z_p p + e$$

- Parity
- Region
- Calving season
- Days in milk (Ali-Schaeffer reg. nested within parity)
- Age at first calving (quadratic regression)

- Herd-year of test-day
- Direct additive genetic effect
- Permanent environmental effect of cow within parity

Residual