



Estimation of genetic parameters of milking speed for Holstein cattle in Croatia

Lučić M.¹, Pocrnić I.¹, Štepec M.², Ivkić Z.¹, Mijić P.³, Barać Z.¹, Špehar M.¹

¹Croatian Agricultural Agency, Ilica 101, 10000 Zagreb, Croatia, e-mail: mlucic@hpa.hr

²University of Ljubljana, Biotechnical Faculty, Department of Animal Science, Groblje 3, SI-1230 Domžale, Slovenia

³University of J.J. Strossmayer in Osijek, Faculty of Agriculture, Kralja P. Svačića 1d, 31000 Osijek, Croatia

Introduction

- ❑ Important functional trait in dairy cattle
 - relationship with udder health
 - labour efficiency
- ❑ Group of workability traits (Interbull)



Objective

- ❑ Genetic evaluation system
- ❑ Develop an animal model for estimation of genetic parameters for milking speed
- ❑ Holstein breed

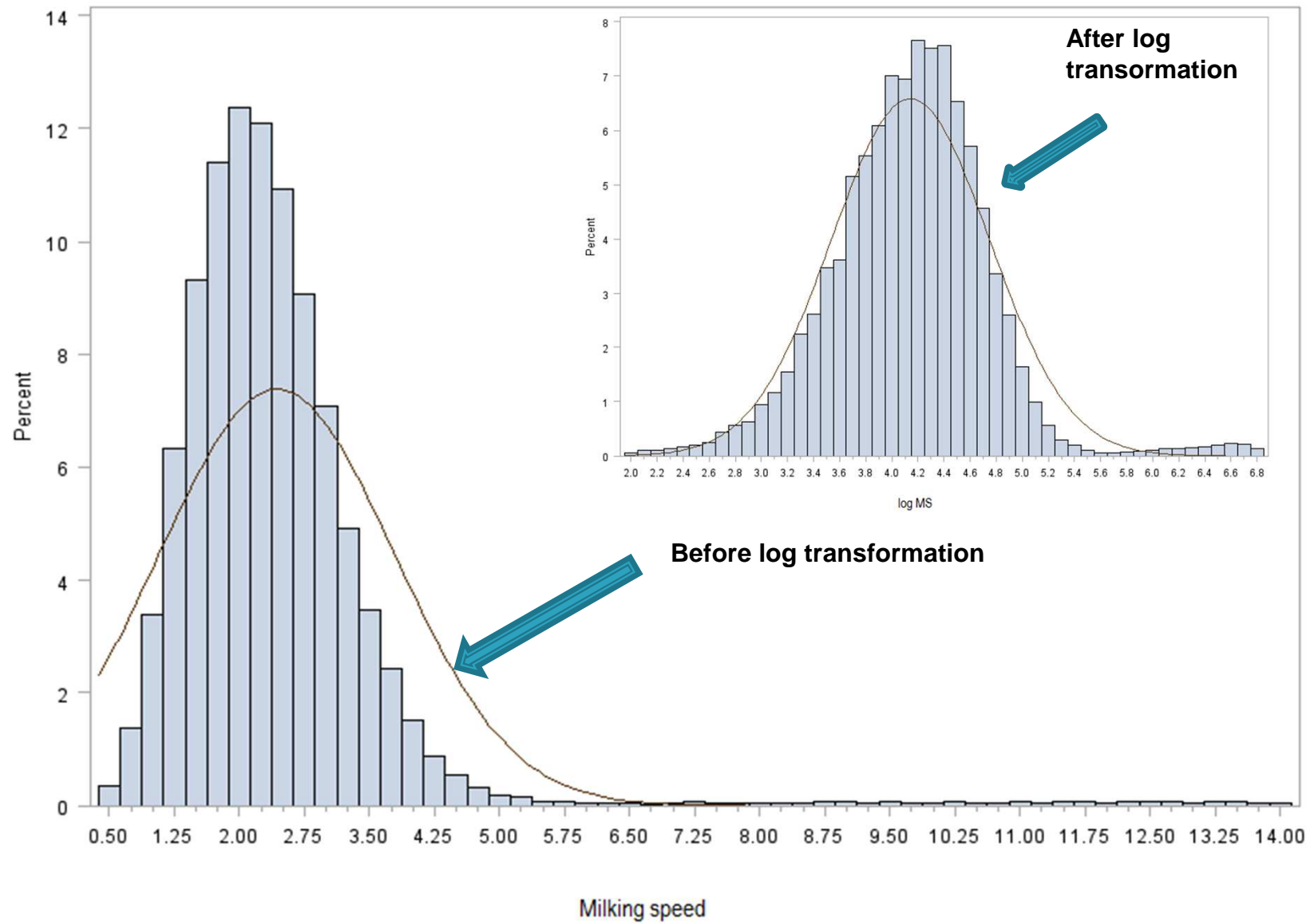




Material



- ❑ Central database of Croatian Agricultural Agency
 - ❑ 1st calving cows for period 2007-2013
 - ❑ Data editing:
 - milking speed (between 0.5 and 14 kg/min)
 - age at calving (from 18 to 40 months)
 - stage of lactation (5 - 180 days)
 - 51,266 test-day records → 15,588 cows
-



Descriptive statistics

Variable	Mean	SD	Min	Max
LogMS	4.11	0.54	2.00	6.00
Milk yield	26.1	6.9	3.0	50.0
Age at 1 st calving	26.6	6.9	18	40
Stage of lactation	93.52	48.28	5	180



Pedigree structure

Item	Number of records
Animals with records	15,588
Non-base animals	28,491
Both parents known	17,192
Only sire known	10,333
Only dam known	966
Base animals	3,530
Total number of animals	32,021



Method

- ❑ GLM procedure (SAS/STAT)
- ❑ Criteria for including effect into the model
 - significance of effect (p-value)
 - determination coefficient (R^2)
 - degrees of freedom (df)
- ❑ Variance components estimation (VCE 6)



Model

Fixed effects:

Age at first calving

Stage of lactation

Calving season

Time of milking

Milk classes

Random effects:

Herd-test day

Permanent environment

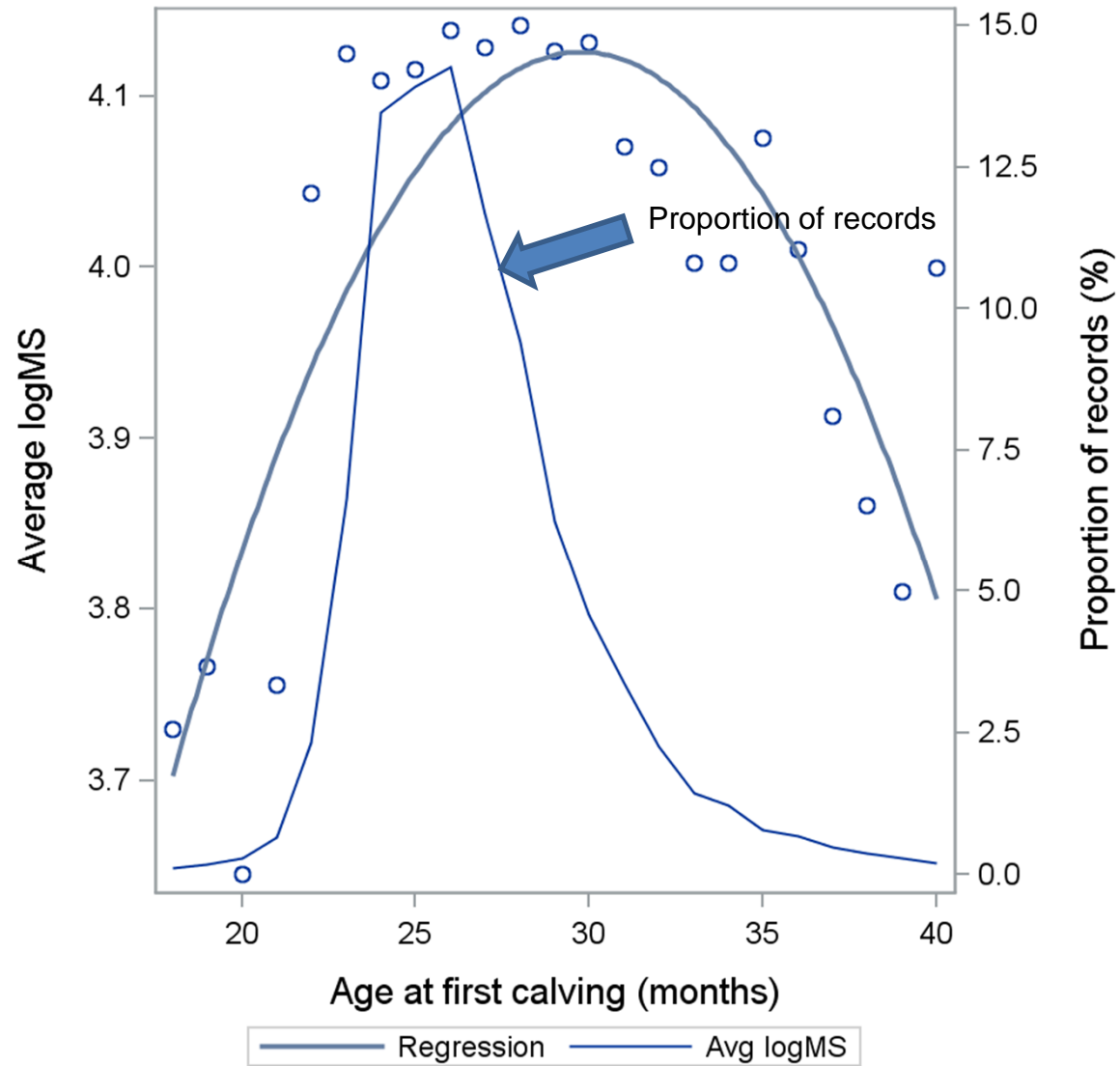
Direct additive genetic effect



Results

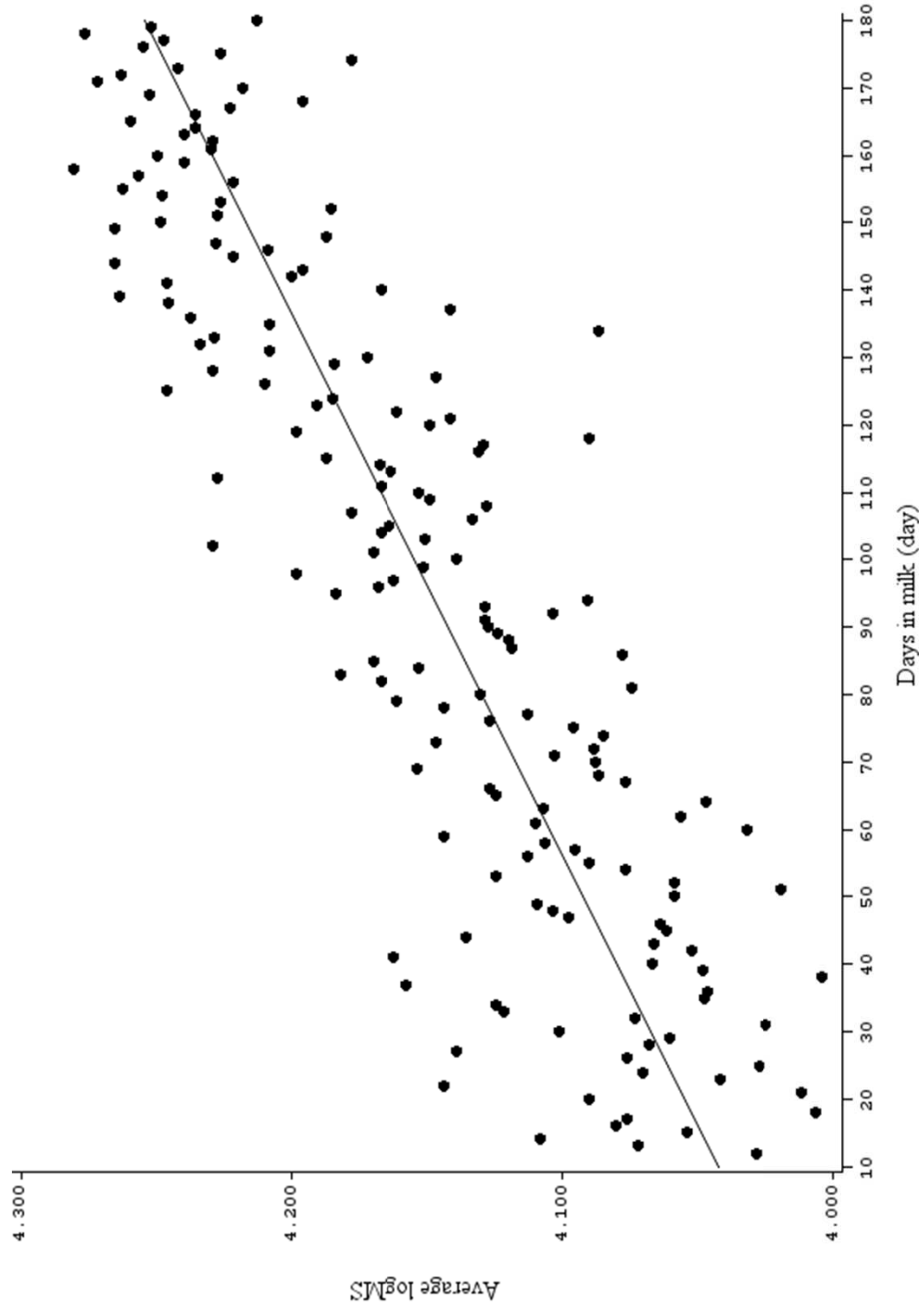


Age at first calving



cattle - hol - ms - 1302

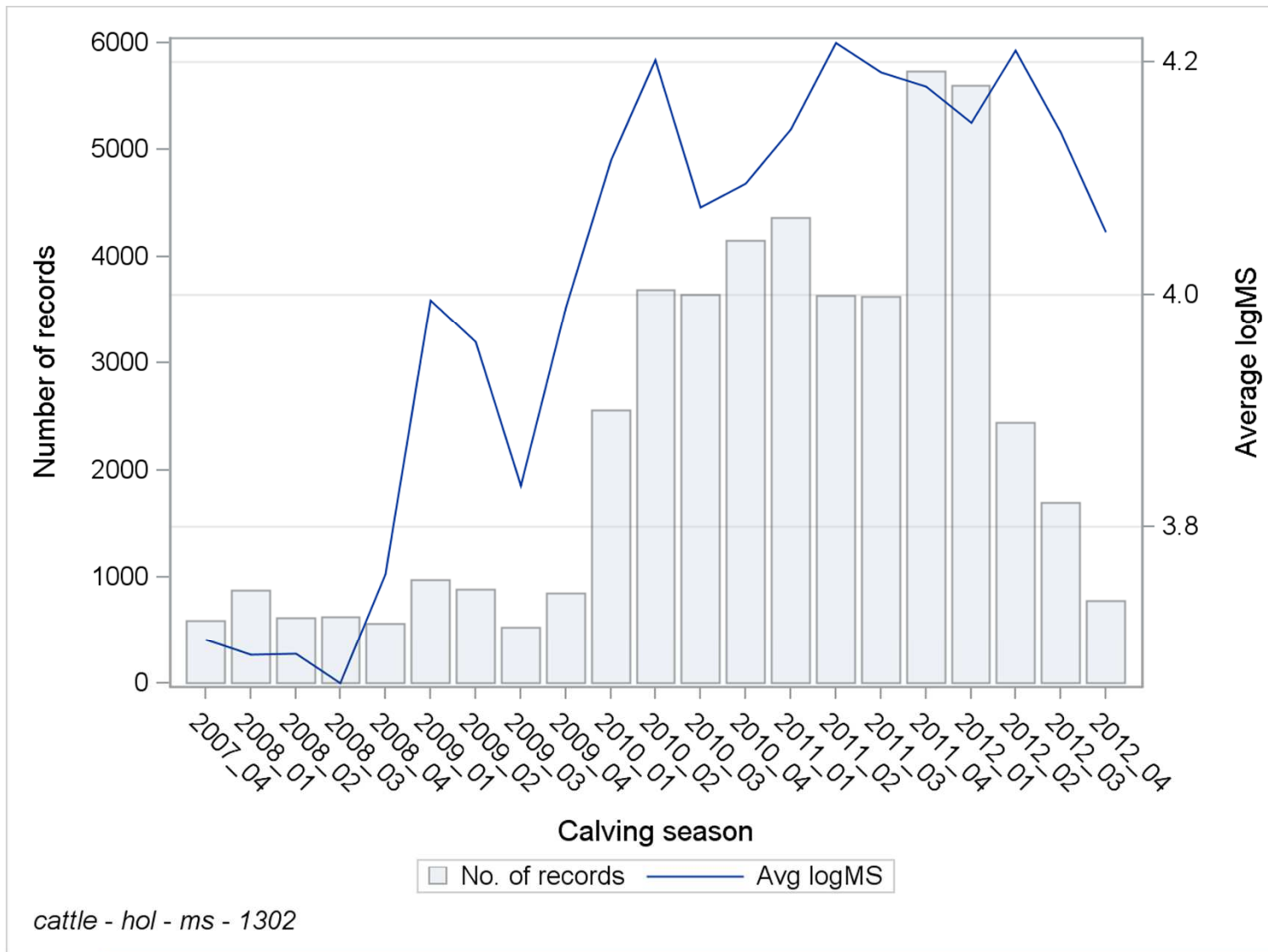
Stage of lactation



cattle - hol - ms - 1302



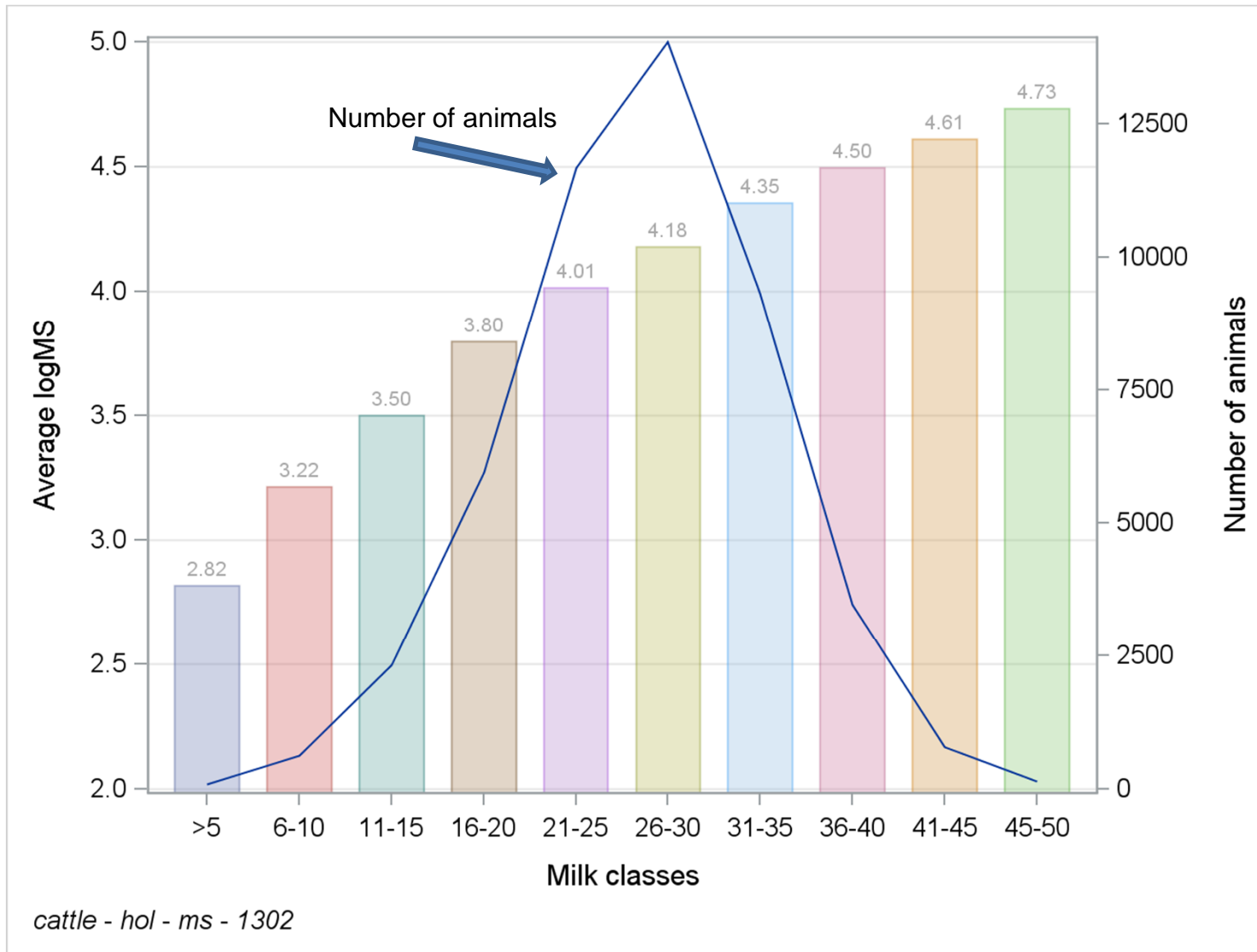
Calving season



cattle - hol - ms - 1302



Milk classes



Estimated ratios (%)



h^2

p^2

c^2

e^2

12±0.014

19±0.013

17±0.007

52±0.006



Conclusions

- ❑ Variance components were estimated for milking speed in Croatian Holstein cattle
- ❑ Genetic evaluation
- ❑ Data and pedigree improvement
- ❑ Relationship with milk production and udder health traits

