

Reviewing the trait definition of mortality in chicken

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INTRODUCTION

- As birds are growing faster and larger, mortality has increased at the phenotypic level
- Mortality is a trait of economic importance and animal welfare concerns
- Mortality may be affected by different genes at different ages

OBJECTIVE

- Explore alternative trait definitions of mortality
- Investigate the maternal genetic effect on mortality

MATERIALS AND METHODS

	Number of records
Pedigree	353,293
Genotypes	100,881
Overall mortality - OM	322,039
Weekly mortality - WM	20,136



- 5 alternative trait definitions developed

Broiler mortality (BM)
 Early mortality (EM)
 Late mortality (LM)
 Cumulative repeatability mortality (CM)
 Binary repeatability mortality (RM)

- Addition of maternal genetic effect

- LR Validation (Legarra and Reverter, 2018)

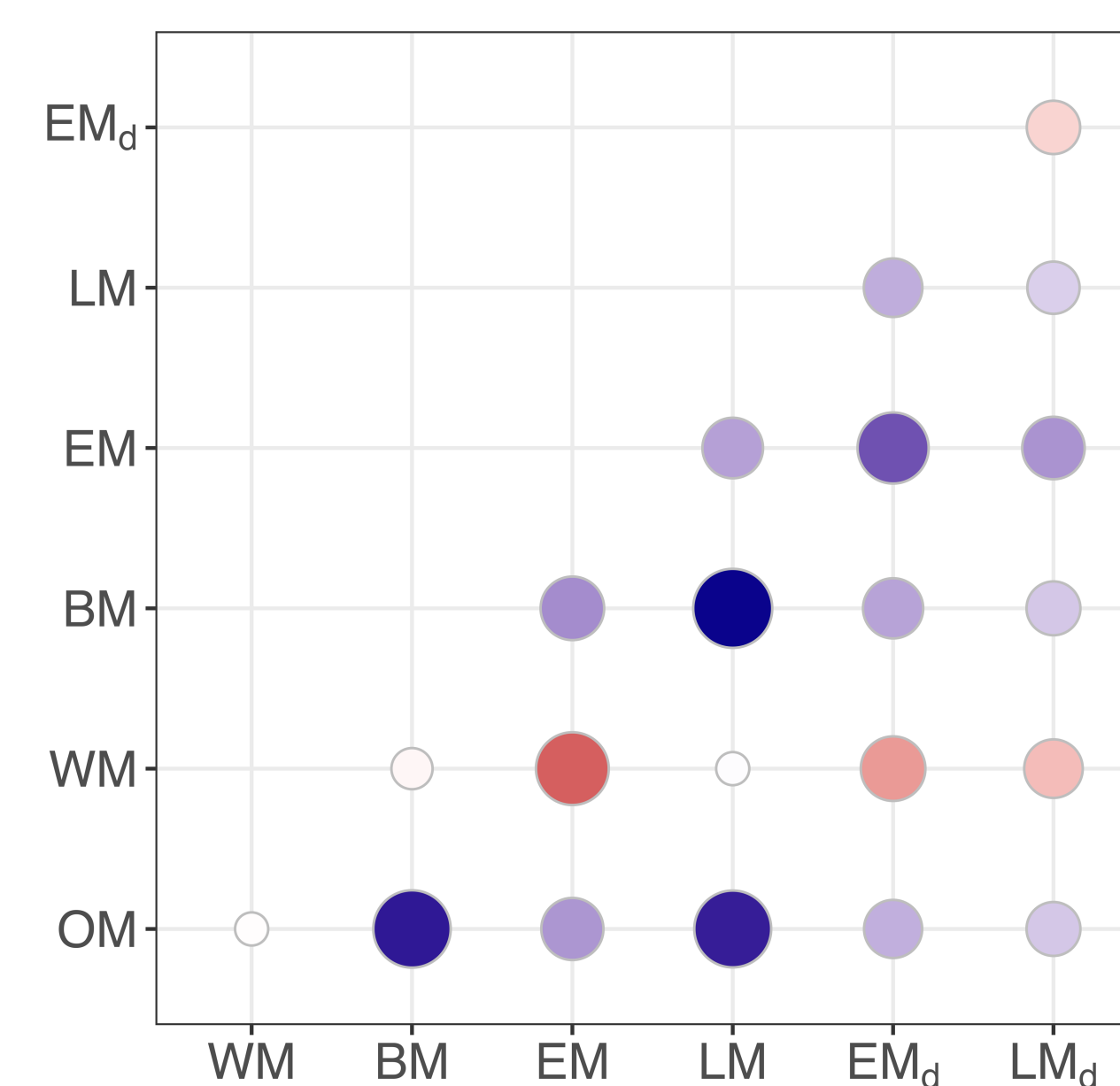
$$acc = \frac{cov(\hat{\mathbf{u}}_w, \hat{\mathbf{u}}_p)}{\sqrt{(1 - \bar{F})\sigma_u^2}} \quad b_1 = \frac{cov(\hat{\mathbf{u}}_w, \hat{\mathbf{u}}_p)}{var(\hat{\mathbf{u}}_p)}$$

RESULTS

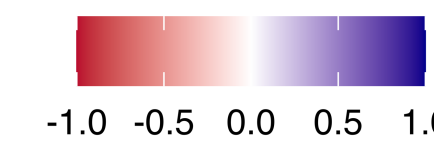
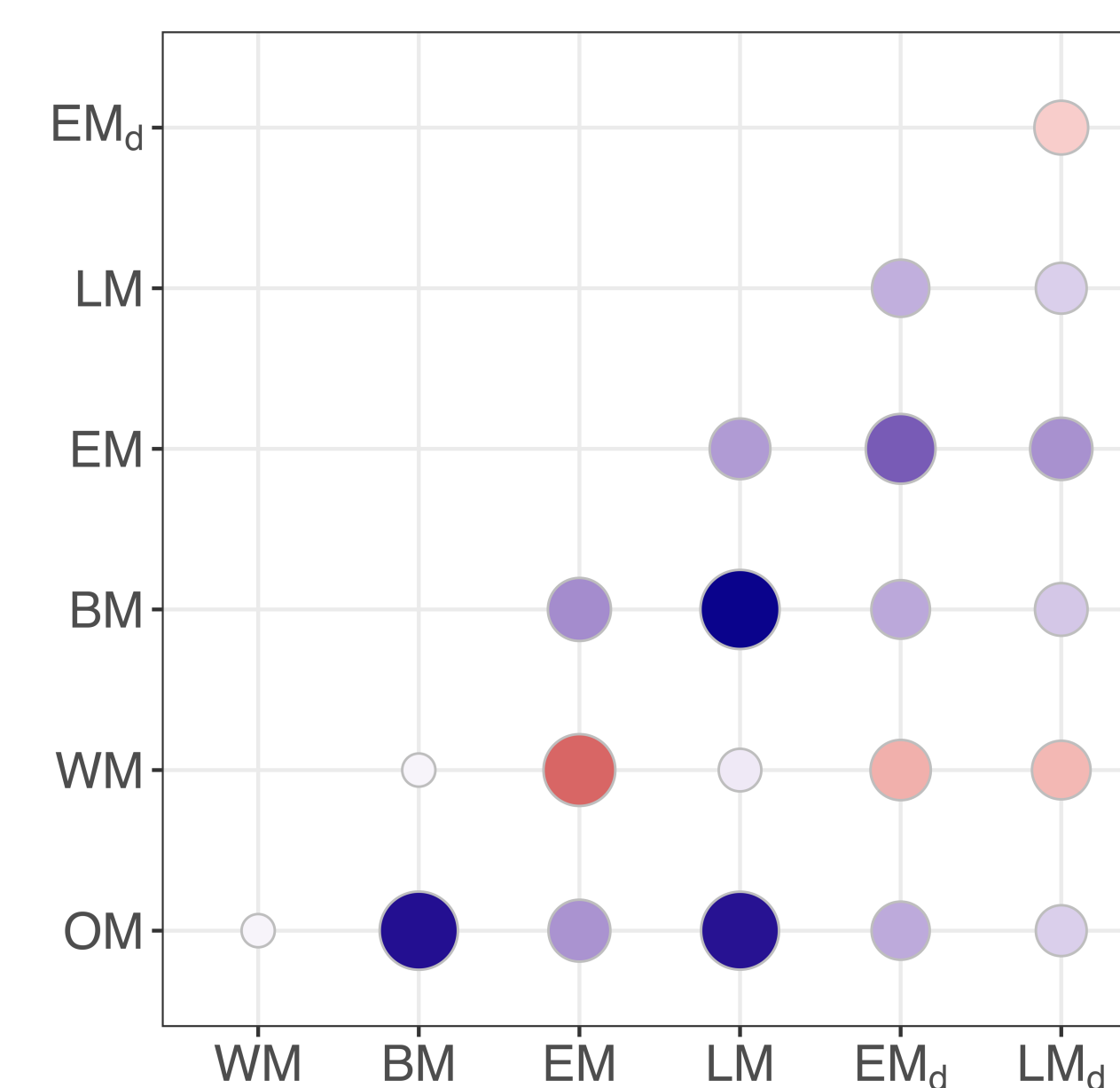
Estimates of genetic parameters

Trait	h^2	h_m^2	$\sigma_{EM,LM}$
OM	0.03 ± 0.00	-	-
WM	0.15 ± 0.01	-	-
BM	0.03 ± 0.00	-	-
CM	0.02 ± 0.00	-	-
RM	0.01 ± 0.00	-	-
EM	0.02 ± 0.01	-	0.81 ± 0.00
LM	0.03 ± 0.01	-	-
EM _{MAT}	0.01 ± 0.00	0.01 ± 0.00	0.25 ± 0.02
LM _{MAT}	0.02 ± 0.00	0.01 ± 0.00	-

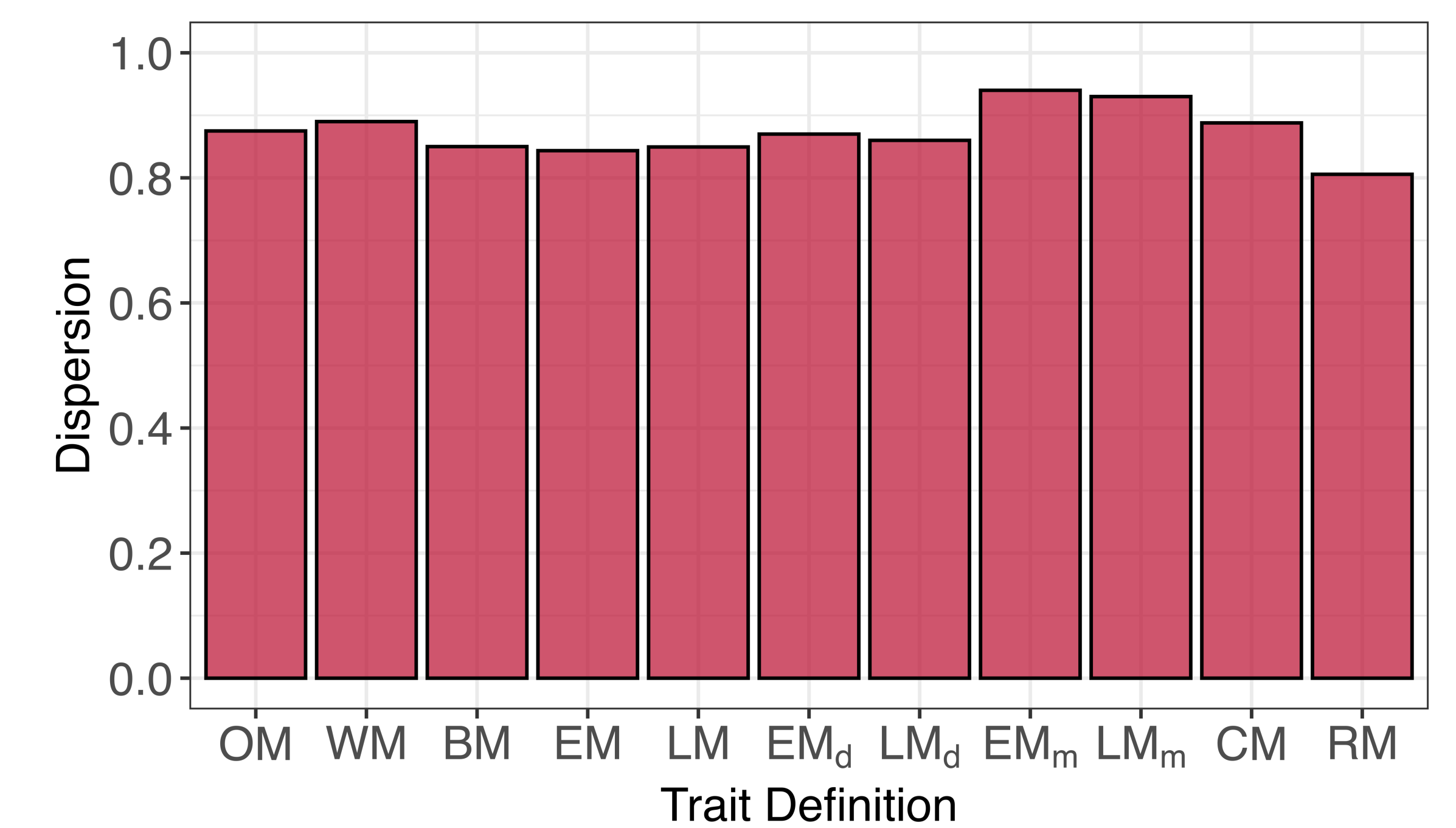
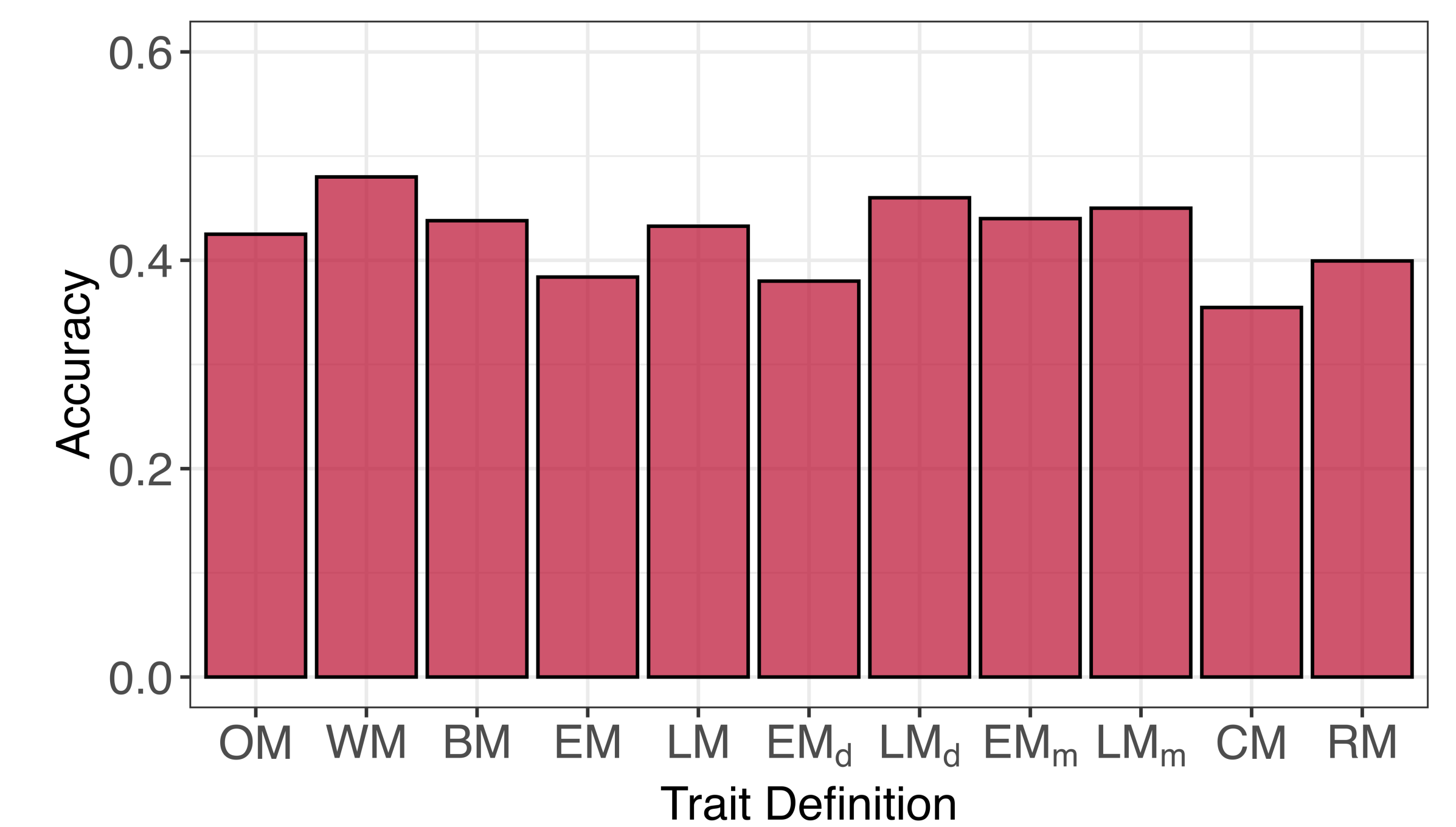
Rank Correlations among top 1%



Rank Correlations among top 5%



LR Validation Statistics



CONCLUSIONS

- Including EM and LM in the selection index may allow for better-informed decisions for selection against mortality
- Maternal genetic effect plays an important role for EM, less for LM
- Changing the trait definitions causes some changes among rank correlations of animals

