

The effect of selected candidate genes on functional longevity of dairy cattle

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CONCLUSIONS

significant association between leptin gene and functional longevity differences in risk of culling for genotypes at R25C and A80V

MATERIAL



ANIMALS: 566 Polish Holstein-Friesian cows

TRAIT: length of production life

GENES: butyrophilin (BTN1A1) (DGAT1)

leptin receptor (LEPR)

leptin (LEP)

ATP binding cassette subf. G (ABCG2)

MODELS

M1

$$h(t) = h_0(t) e^{ys(t)+sl(t)+hs(t)+fat(t)+prot(t)+age}$$

M2₁-M2₉

$$h(t) = h_0(t) e^{ys(t)+sl(t)+hs(t)+fat(t)+prot(t)+age+SNP_i}$$

M3₁-M3₉

$$h(t) = h_0(t) e^{ys(t)+sl(t)+hs(t)+fat(t)+prot(t)+age+SNP_{-i}}$$

M4

$$h(t) = h_0(t) e^{ys(t)+sl(t)+hs(t)+fat(t)+prot(t)+age+SNP_1+...+SNP_9}$$

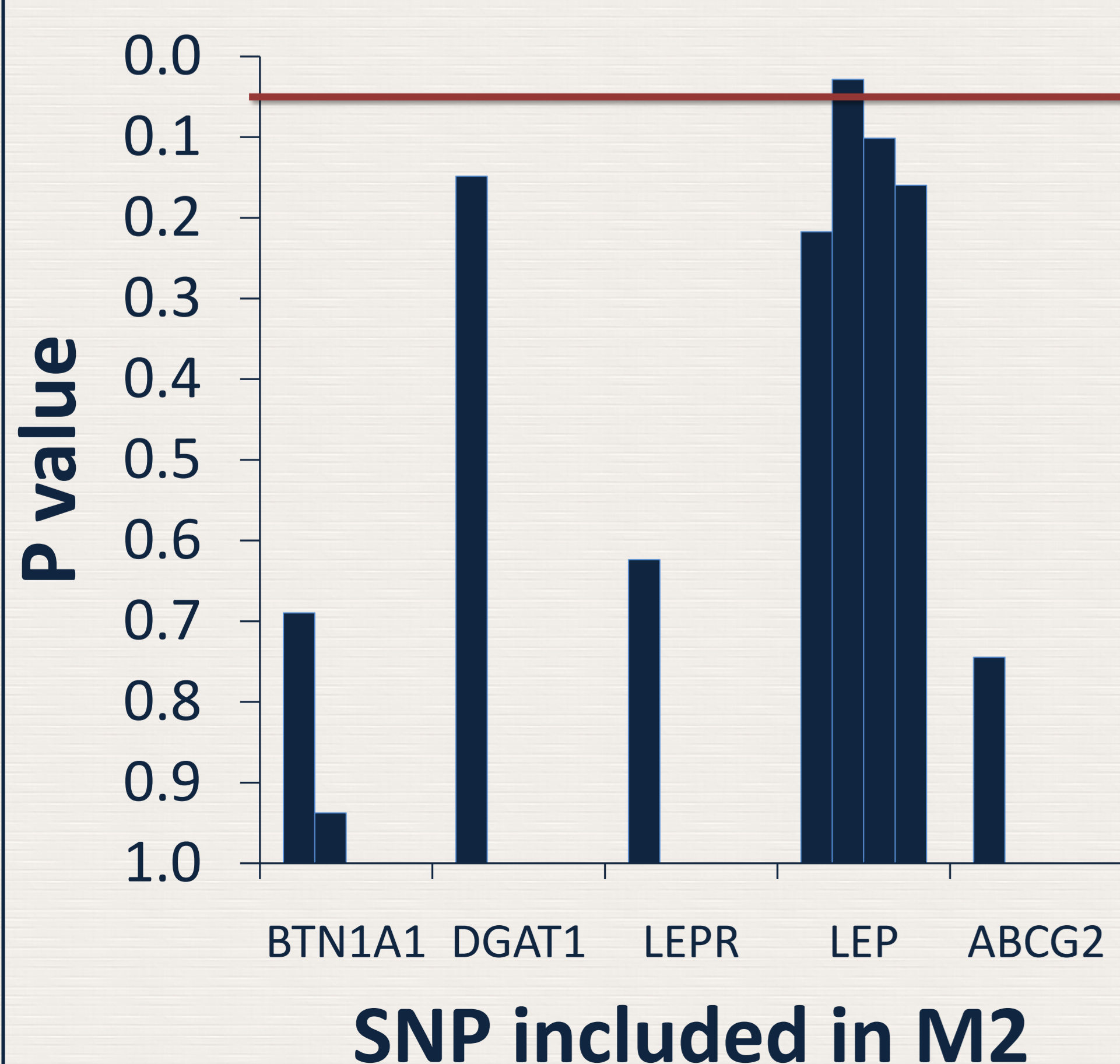
h(t) - relative risk of culling; **h₀(t)** - baseline hazard function; **ys(t)** - year-season; **sl(t)** - lactation × stage of lactation; **hs(t)** - herd size change; **fat(t)** - fat production level; **prot(t)** - protein production level; **age** - age at first calving; **SNP_i** - i-th SNP; **SNP_{-i}** - all SNPs except i;

HYPOTHESIS TEST

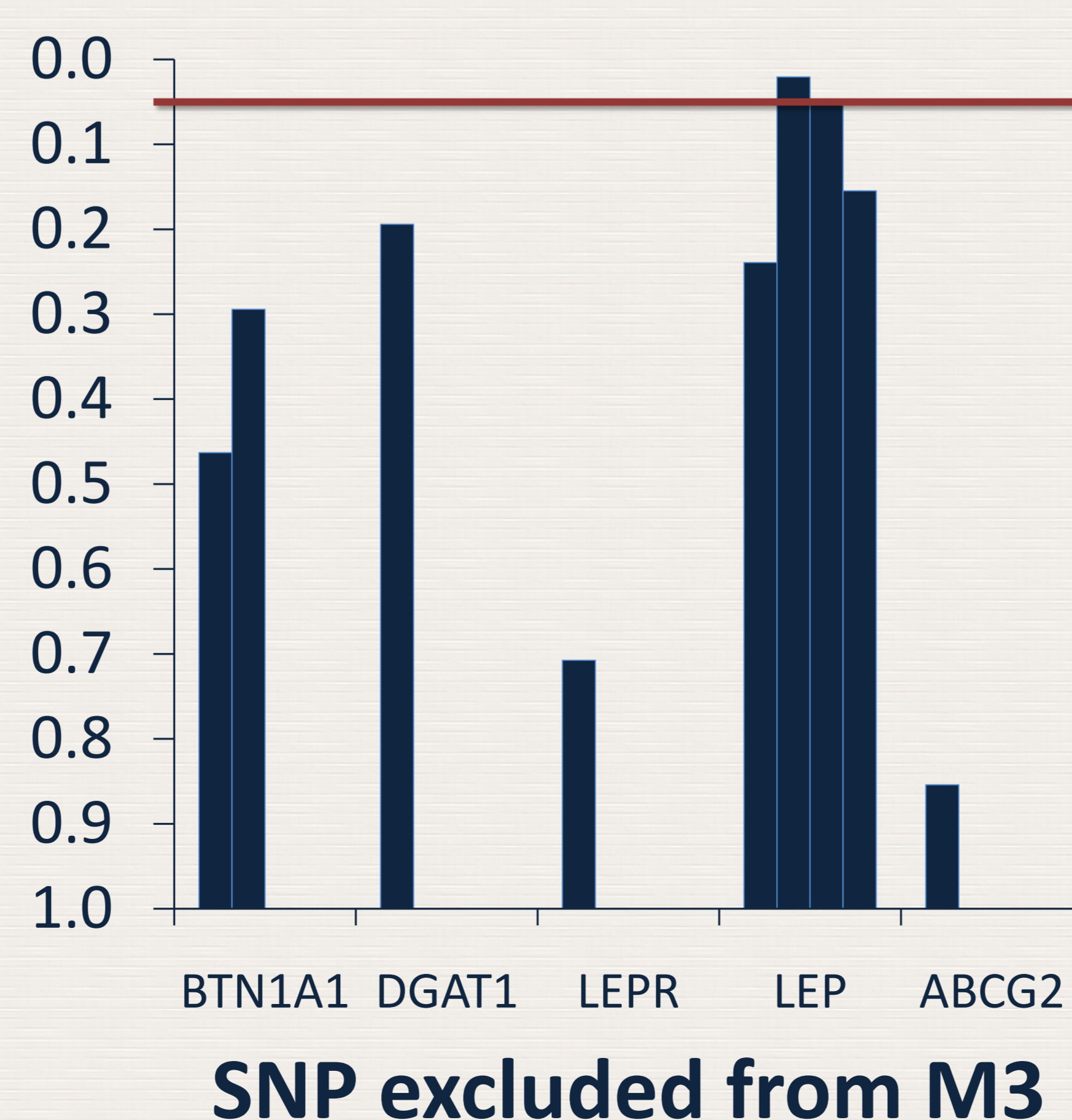
$$\lambda = -2 \left[\ln L(\hat{\beta}_0) - \ln L(\hat{\beta}_1) \right]$$

RESULTS

P value for λ M1 vs M2



P value for λ M3 vs M4



relative risk for SNP genotypes

