

```
> mixmod0a<-lmer(ZZrat~AB_TS+Rasse+Lakt+LL1+(1|LFBIS) +(1|TierID),data=dataopt1)
Warning messages:
1: Some predictor variables are on very different scales: consider rescaling
2: In checkConv(attr(opt, "derivs"), opt$par, ctrl = control$checkConv, :
  Model failed to converge with max|grad| = 0.00282702 (tol = 0.002, component 1)
3: Some predictor variables are on very different scales: consider rescaling
> summary(mixmod0a)
Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest']
Formula: ZZrat ~ AB_TS + Rasse + Lakt + LL1 + (1 | LFBIS) + (1 | TierID)
Data: dataopt1

REML criterion at convergence: 2688

Scaled residuals:
    Min       1Q   Median       3Q      Max
-2.12193 -0.41863 -0.02358  0.36457  2.80407

Random effects:
 Groups   Name      Variance Std.Dev.
 TierID   (Intercept) 0.23293  0.4826
 LFBIS    (Intercept) 0.01147  0.1071
 Residual                0.15561  0.3945
Number of obs: 1380, groups: TierID, 1375; LFBIS, 237

Fixed effects:
              Estimate Std. Error        df t value Pr(>|t|)
(Intercept) -3.535e-01  8.383e-02  7.132e+02 -4.217 2.80e-05 ***
AB_TS1      -2.309e-01  3.524e-02  9.375e+02 -6.553 9.27e-11 ***
Rasse2       1.183e-01  6.153e-02  2.574e+02  1.923  0.05561 .
Rasse5      -1.117e-01  2.672e-01  1.006e+03 -0.418  0.67607
Rasse8       3.677e-02  5.725e-02  3.474e+02  0.642  0.52111
Rasse9      -1.023e-02  1.354e-01  1.324e+03 -0.076  0.93977
Lakt        -2.900e-02  9.947e-03  1.327e+03 -2.916  0.00361 **
LL1          1.545e-05  1.000e-05  5.780e+02  1.544  0.12309
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) AB_TS1 Rasse2 Rasse5 Rasse8 Rasse9 Lakt
AB_TS1 -0.146
Rasse2 -0.098 -0.068
Rasse5 -0.139  0.029  0.025
Rasse8  0.121 -0.019  0.149 -0.003
Rasse9  0.034 -0.003  0.053  0.000  0.104
Lakt   -0.058 -0.013  0.017 -0.005  0.153  0.071
LL1    -0.895 -0.036  0.016  0.118 -0.262 -0.093 -0.274
fit warnings:
Some predictor variables are on very different scales: consider rescaling
optimizer (nloptwrap) convergence code: 0 (OK)
Model failed to converge with max|grad| = 0.00282702 (tol = 0.002, component 1)
```

*AU: We transformed the milk yield variable for rescaling, since we get several warning messages, by the software, when using untransformed milk yield. As you can see there are no relevant differences between both models, beside the warnings. (Please do not be confused by the other variable names, we used in the original code (ZZRat= CCR, LL1=milk yield before and so on).*

```
Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest']
Formula: ZZrat ~ AB_TS + Rasse + Lakt + sqrt(LL1) + (1 | LFBIS) + (1 | TierID)
Data: dataopt1

REML criterion at convergence: 2677.6

Scaled residuals:
    Min       1Q   Median       3Q      Max
-2.12245 -0.41787 -0.02372  0.36835  2.80983

Random effects:
 Groups   Name      Variance Std.Dev.
 TierID   (Intercept) 0.23265  0.4823
 LFBIS    (Intercept) 0.01147  0.1071
 Residual                0.15588  0.3948
Number of obs: 1380, groups: TierID, 1375; LFBIS, 237

Fixed effects:
              Estimate Std. Error        df t value Pr(>|t|)
(Intercept) -4.858e-01  1.640e-01  6.369e+02 -2.963  0.00316 **
AB_TS1      -2.309e-01  3.524e-02  9.372e+02 -6.552 9.35e-11 ***
Rasse2       1.181e-01  6.153e-02  2.573e+02  1.919  0.05610 .
Rasse5      -1.025e-01  2.679e-01  1.018e+03 -0.383  0.70216
Rasse8       3.659e-02  5.725e-02  3.468e+02  0.639  0.52316
Rasse9      -1.028e-02  1.354e-01  1.323e+03 -0.076  0.93949
Lakt        -2.898e-02  9.937e-03  1.329e+03 -2.916  0.00361 **
sqrt(LL1)    2.878e-03  1.851e-03  5.738e+02  1.555  0.12058
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) AB_TS1 Rasse2 Rasse5 Rasse8 Rasse9 Lakt
AB_TS1 -0.057
Rasse2 -0.056 -0.068
Rasse5 -0.153  0.028  0.025
Rasse8  0.198 -0.019  0.149 -0.009
Rasse9  0.065 -0.003  0.054 -0.002  0.104
Lakt   -0.108 -0.014  0.017 -0.011  0.153  0.070
sqrt(LL1) -0.974 -0.035  0.014  0.139 -0.263 -0.093 -0.270
```