

# Análisis de datos

## Grupos funcionales

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Print results

```
[1] "#####"
[1] "                "
[1] "                "
[1] "RemovalCommunity"
[1] "                "
[1] "                "
[1] "#####"
[1] "                "
[1] "                "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: RemovalCommunity ~ 1 + (1 | GrazingEnviroments)
DB: RemovalCommunity ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull    3 182.44 184.57 -88.222   176.44
DB         5 182.22 185.76 -86.111   172.22 4.221  2    0.1212

[1] "Summary model"
[[1]]
Linear mixed model fit by REML ['lmerMod']
Formula: RemovalCommunity ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

REML criterion at convergence: 145.3

Scaled residuals:
      Min       1Q   Median       3Q      Max
-1.6415 -0.5583  0.1014  0.5222  2.0014

Random effects:
      Groups             Name             Variance Std.Dev.
GrazingEnviroments (Intercept)      0         0.00
Residual                          7092      84.22
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
```

	Estimate	Std. Error	t value
(Intercept)	57.30	37.66	1.521
BurningRegimeLow	64.79	53.26	1.216
BurningRegimeHigh	104.15	53.26	1.955

Correlation of Fixed Effects:

```

(Intr) BrnnRL
BurnngRgmLw -0.707
BrnnRgmHgh -0.707 0.500
optimizer (nloptwrap) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

```

```

[1] "Post hoc Test"
[[1]]

```

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

```

Fit: lmer(formula = RemovalCommunity ~ BurningRegime + (1 | GrazingEnviroments),
data = GLMMDB)

```

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	64.79	53.26	1.216	0.443
High - Null == 0	104.15	53.26	1.955	0.123
High - Low == 0	39.36	53.26	0.739	0.740

(Adjusted p values reported -- single-step method)

```

[1] "Check Overdispersion"
[[1]]
# Overdispersion test

```

```

dispersion ratio = 0.866
p-value = 0.872

```

No overdispersion detected.

```

[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.973).

```

```

[1] "#####"
[1] " "
[1] " "
[1] "RemovalSpecies"
[1] " "
[1] " "
[1] "#####"

```

```

[1] "
[1] "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: RemovalSpecies ~ 1 + (1 | GrazingEnviroments)
DB: RemovalSpecies ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 159.41 161.53 -76.704   153.41
DB        5 163.27 166.81 -76.635   153.27 0.1384  2    0.9331

```

```

[1] "Summary model"
[[1]]
Linear mixed model fit by REML ['lmerMod']
Formula: RemovalSpecies ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

```

REML criterion at convergence: 129.8

```

Scaled residuals:
      Min       1Q   Median       3Q      Max
-1.2093 -0.5664 -0.3713  0.6802  1.6470

```

```

Random effects:
Groups          Name           Variance Std.Dev.
GrazingEnviroments (Intercept)  417.9   20.44
Residual                1732.2   41.62
Number of obs: 15, groups: GrazingEnviroments, 3

```

```

Fixed effects:
              Estimate Std. Error t value
(Intercept)    26.935     22.575   1.193
BurningRegimeLow  7.165     26.638   0.269
BurningRegimeHigh 2.339     28.628   0.082

```

```

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.605
BrnnRgmHgh -0.620  0.501

```

```

[1] "Post hoc Test"
[[1]]

```

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

```

Fit: lmer(formula = RemovalSpecies ~ BurningRegime + (1 | GrazingEnviroments),
data = GLMMDB)

```

```

Linear Hypotheses:
              Estimate Std. Error z value Pr(>|z|)

```

```

Low - Null == 0      7.165      26.638    0.269    0.961
High - Null == 0     2.339      28.628    0.082    0.996
High - Low == 0     -4.826      27.651   -0.175    0.983
(Adjusted p values reported -- single-step method)

```

```

[1] "Check Overdispersion"
[[1]]
# Overdispersion test

```

```

dispersion ratio = 0.886
p-value = 0.84

```

No overdispersion detected.

```

[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.095).

```

```

[1] "#####"
[1] "          "
[1] "          "
[1] "q1"
[1] "          "
[1] "          "
[1] "#####"
[1] "          "
[1] "          "
[1] "Modelo test"
[[1]]

```

Data: GLMMDB

Models:

DBNull: q1 ~ 1 + (1 | GrazingEnviroments)

DB: q1 ~ BurningRegime + (1 | GrazingEnviroments)

	npar	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
DBNull	3	54.097	56.221	-24.048	48.097			
DB	5	56.833	60.374	-23.417	46.833	1.2634	2	0.5317

```

[1] "Summary model"
[[1]]

```

Linear mixed model fit by REML ['lmerMod']

Formula: q1 ~ BurningRegime + (1 | GrazingEnviroments)

Data: GLMMDB

REML criterion at convergence: 45

Scaled residuals:

Min	1Q	Median	3Q	Max
-1.1564	-0.7765	0.1839	0.4190	1.6531

Random effects:

Groups	Name	Variance	Std.Dev.
--------	------	----------	----------

```

GrazingEnviroments (Intercept) 0.000    0.000
Residual                      1.661    1.289
Number of obs: 15, groups:  GrazingEnviroments, 3

```

Fixed effects:

	Estimate	Std. Error	t value
(Intercept)	3.8505	0.5764	6.680
BurningRegimeLow	0.1716	0.8151	0.211
BurningRegimeHigh	0.7953	0.8151	0.976

Correlation of Fixed Effects:

```

(Intr) BrnnRL
BurnngRgmLw -0.707
BrnnRgmHgh -0.707  0.500
optimizer (nloptwrap) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

```

```

[1] "Post hoc Test"
[[1]]

```

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

```

Fit: lmer(formula = q1 ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB)

```

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	0.1716	0.8151	0.211	0.976
High - Null == 0	0.7953	0.8151	0.976	0.592
High - Low == 0	0.6237	0.8151	0.765	0.724

(Adjusted p values reported -- single-step method)

```

[1] "Check Overdispersion"
[[1]]
# Overdispersion test

```

```

dispersion ratio = 0.866
p-value = 0.872

```

No overdispersion detected.

```

[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.767).

```

```

[1] "#####"
[1] "      "

```

```

[1] "
[1] "q2"
[1] "
[1] "
[1] "#####"
[1] "
[1] "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: q2 ~ 1 + (1 | GrazingEnviroments)
DB: q2 ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 51.842 53.966 -22.921  45.842
DB        5 53.944 57.484 -21.972  43.944 1.8982  2    0.3871

[1] "Summary model"
[[1]]
Linear mixed model fit by REML ['lmerMod']
Formula: q2 ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

REML criterion at convergence: 42.7

Scaled residuals:
      Min       1Q   Median       3Q      Max
-1.43303 -0.71216 -0.05968  0.58452  1.52217

Random effects:
      Groups             Name             Variance Std.Dev.
GrazingEnviroments (Intercept)  0.00         0.00
Residual                    1.37         1.17
Number of obs: 15, groups:  GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error t value
(Intercept)    2.8394     0.5235   5.424
BurningRegimeLow  0.4759     0.7403   0.643
BurningRegimeHigh 0.9419     0.7403   1.272

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.707
BrnnRgmHgh -0.707  0.500
optimizer (nloptwrap) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

[1] "Post hoc Test"
[[1]]

```

Simultaneous Tests for General Linear Hypotheses

# Multiple Comparisons of Means: Tukey Contrasts

```
Fit: lmer(formula = q2 ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB)
```

## Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	0.4759	0.7403	0.643	0.796
High - Null == 0	0.9419	0.7403	1.272	0.411
High - Low == 0	0.4660	0.7403	0.629	0.804

(Adjusted p values reported -- single-step method)

```
[1] "Check Overdispersion"
```

```
[[1]]
```

```
# Overdispersion test
```

```
dispersion ratio = 0.866
p-value = 0.872
```

```
No overdispersion detected.
```

```
[1] "Check Residuals"
```

```
[[1]]
```

```
OK: Simulated residuals appear as uniformly distributed (p = 0.866).
```

```
[1] "#####"
```

```
[1] " "
```

```
[1] " "
```

```
[1] "Abundance"
```

```
[1] " "
```

```
[1] " "
```

```
[1] "#####"
```

```
[1] " "
```

```
[1] " "
```

```
[1] "Modelo test"
```

```
[[1]]
```

```
Data: GLMMDB
```

```
Models:
```

```
DBNull: Abundance ~ 1 + (1 | GrazingEnviroments)
```

```
DB: Abundance ~ BurningRegime + (1 | GrazingEnviroments)
```

	npar	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
DBNull	3	163.40	165.53	-78.702	157.40			
DB	5	164.11	167.66	-77.057	154.11	3.2895	2	0.1931

```
[1] "Summary model"
```

```
[[1]]
```

```
Linear mixed model fit by REML ['lmerMod']
```

```
Formula: Abundance ~ BurningRegime + (1 | GrazingEnviroments)
```

```
Data: GLMMDB
```

REML criterion at convergence: 130.4

Scaled residuals:

Min	1Q	Median	3Q	Max
-1.2103	-0.5789	-0.1882	0.6902	1.7743

Random effects:

Groups	Name	Variance	Std.Dev.
GrazingEnviroments	(Intercept)	472	21.73
Residual		1812	42.57

Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:

	Estimate	Std. Error	t value
(Intercept)	89.024	23.363	3.810
BurningRegimeLow	-44.387	27.260	-1.628
BurningRegimeHigh	-9.685	29.377	-0.330

Correlation of Fixed Effects:

	(Intr)	BrnnRL
BurnngRgmLw	-0.599	
BrnnRgmHgh	-0.614	0.501

[1] "Post hoc Test"  
[[1]]

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

Fit: lmer(formula = Abundance ~ BurningRegime + (1 | GrazingEnviroments),  
data = GLMMDB)

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	-44.387	27.260	-1.628	0.233
High - Null == 0	-9.685	29.377	-0.330	0.942
High - Low == 0	34.702	28.338	1.225	0.438

(Adjusted p values reported -- single-step method)

[1] "Check Overdispersion"  
[[1]]  
# Overdispersion test

dispersion ratio = 0.887  
p-value = 0.848

No overdispersion detected.

[1] "Check Residuals"



```

[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.798).

[1] "#####"
[1] "          "
[1] "          "
[1] "q0"
[1] "          "
[1] "          "
[1] "#####"
[1] "          "
[1] "          "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: q0 ~ 1 + (1 | GrazingEnviroments)
DB: q0 ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 69.506 71.630 -31.753   63.506
DB        5 72.678 76.218 -31.339   62.678 0.8284  2    0.6609

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(918515.9) ( log )
Formula: q0 ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC logLik deviance df.resid
72.7      76.2   -31.3    62.7        10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-1.24985 -0.34978 -0.08032  0.36421  0.95578

Random effects:
      Groups             Name             Variance Std.Dev.
      GrazingEnviroments (Intercept) 0          0
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    2.00148    0.15653  12.787  <2e-16 ***
BurningRegimeLow -0.17693    0.23599  -0.750   0.453
BurningRegimeHigh 0.02667    0.21823   0.122   0.903
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.655
BrnnRgmHgh -0.688  0.451

```

```
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')
```

```
[1] "Post hoc Test"
[[1]]
```

#### Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

```
Fit: lme4::glmer(formula = q0 ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 918515.932480435))
```

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	-0.17693	0.23599	-0.750	0.733
High - Null == 0	0.02667	0.21823	0.122	0.992
High - Low == 0	0.20360	0.23849	0.854	0.669

(Adjusted p values reported -- single-step method)

```
[1] "Check Overdispersion"
[[1]]
# Overdispersion test
```

```
dispersion ratio = 0.419
p-value = 0.064
```

No overdispersion detected.

```
[1] "Check Residuals"
[[1]]
```

OK: Simulated residuals appear as uniformly distributed (p = 0.771).

```
[1] "#####"
[1] "
[1] "
[1] "Tunnelers"
[1] "
[1] "
[1] "#####"
[1] "
[1] "
[1] "Modelo test"
[[1]]
```

Data: GLMMDB

Models:

DBNull: Tunnelers ~ 1 + (1 | GrazingEnviroments)

DB: Tunnelers ~ BurningRegime + (1 | GrazingEnviroments)

npar	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
------	-----	-----	--------	----------	-------	----	------------

```

DBNull    3 131.50 133.63 -62.751   125.50
DB         5 129.38 132.92 -59.688   119.38 6.1263  2    0.04674 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.8313) ( log )
Formula: Tunnelers ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC   logLik deviance df.resid
  129.4    132.9   -59.7    119.4        10

Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.1528 -0.6819 -0.2126  0.6516  1.7069

Random effects:
 Groups              Name              Variance Std.Dev.
 GrazingEnviroments (Intercept) 0          0
Number of obs: 15, groups:  GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      3.42100   0.34022  10.055 <2e-16 ***
BurningRegimeLow -1.24625   0.49768  -2.504  0.0123 *
BurningRegimeHigh  0.05096   0.48080   0.106  0.9156
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.684
BrnnRgmHgh -0.708  0.484
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

[1] "Post hoc Test"
[[1]]

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

Fit: lme4::glmer(formula = Tunnelers ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 1.83129403943445))

Linear Hypotheses:
      Estimate Std. Error z value Pr(>|z|)

```

```

Low - Null == 0  -1.24625    0.49768  -2.504   0.0328 *
High - Null == 0  0.05096    0.48080   0.106   0.9938
High - Low == 0   1.29721    0.49736   2.608   0.0245 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- single-step method)

```

```

[1] "Check Overdispersion"
[[1]]
# Overdispersion test

```

```

dispersion ratio = 0.798
p-value = 0.992

```

No overdispersion detected.

```

[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.848).

```

```

[1] "#####"
[1] "                "
[1] "                "
[1] "Rollers"
[1] "                "
[1] "                "
[1] "#####"
[1] "                "
[1] "                "
[1] "Modelo test"
[[1]]

```

Data: GLMMDB

Models:

DBNull: Rollers ~ 1 + (1 | GrazingEnviroments)

DB: Rollers ~ BurningRegime + (1 | GrazingEnviroments)

	npar	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
DBNull	3	148.44	150.57	-71.221	142.44			
DB	5	150.66	154.20	-70.330	140.66	1.7828	2	0.4101

[1] "Summary model"

[[1]]

Generalized linear mixed model fit by maximum likelihood (Laplace  
Approximation) [glmerMod]

Family: Negative Binomial(2.6241) ( log )

Formula: Rollers ~ BurningRegime + (1 | GrazingEnviroments)

Data: GLMMDB

	AIC	BIC	logLik	deviance	df.resid
	150.7	154.2	-70.3	140.7	10

Scaled residuals:

Min	1Q	Median	3Q	Max
-1.2759	-0.6154	-0.3954	0.7135	1.7665

Random effects:

Groups	Name	Variance	Std.Dev.
GrazingEnviroments	(Intercept)	0.1049	0.3238

Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:

	Estimate	Std. Error	z value	Pr(> z )
(Intercept)	4.0041	0.3732	10.728	<2e-16 ***
BurningRegimeLow	-0.5544	0.4060	-1.365	0.172
BurningRegimeHigh	-0.1910	0.4939	-0.387	0.699

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:

	(Intr)	BrnnRL
BurnngRgmLw	-0.582	
BrnnRgmHgh	-0.676	0.478

[1] "Post hoc Test"

[[1]]

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

Fit: lme4::glmer(formula = Rollers ~ BurningRegime + (1 | GrazingEnviroments),  
data = GLMMDB, family = MASS::negative.binomial(theta = 2.62409977247024))

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	-0.5544	0.4060	-1.365	0.357
High - Null == 0	-0.1910	0.4939	-0.387	0.920
High - Low == 0	0.3633	0.4661	0.780	0.714

(Adjusted p values reported -- single-step method)

[1] "Check Overdispersion"

[[1]]

# Overdispersion test

dispersion ratio = 0.860  
p-value = 0.848

No overdispersion detected.

[1] "Check Residuals"

[[1]]

OK: Simulated residuals appear as uniformly distributed (p = 0.927).

```

[1] "#####"
[1] " "
[1] " "
[1] "Small"
[1] " "
[1] " "
[1] "#####"
[1] " "
[1] " "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: Small ~ 1 + (1 | GrazingEnviroments)
DB: Small ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 127.63 129.75 -60.814   121.63
DB        5 125.80 129.34 -57.899   115.80 5.8296  2    0.05422 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.39) ( log )
Formula: Small ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC  logLik deviance df.resid
125.8    129.3   -57.9    115.8      10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-1.0715 -0.5676 -0.2598  0.5658  1.3627

Random effects:
Groups             Name      Variance Std.Dev.
GrazingEnviroments (Intercept) 5.801e-12 2.409e-06
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    3.35341    0.38843   8.633  <2e-16 ***
BurningRegimeLow -1.46634    0.57014  -2.572  0.0101 *
BurningRegimeHigh -0.05757    0.54970  -0.105  0.9166
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.681
BrnnRgmHgh -0.707  0.481

```

```
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')
```

```
[1] "Post hoc Test"
[[1]]
```

#### Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

```
Fit: lme4::glmer(formula = Small ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 1.39001100057215))
```

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	-1.46634	0.57014	-2.572	0.0273 *
High - Null == 0	-0.05757	0.54970	-0.105	0.9940
High - Low == 0	1.40877	0.57051	2.469	0.0362 *

---

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- single-step method)
```

```
[1] "Check Overdispersion"
[[1]]
```

# Overdispersion test

```
dispersion ratio = 0.715
p-value = 0.824
```

No overdispersion detected.

```
[1] "Check Residuals"
[[1]]
```

OK: Simulated residuals appear as uniformly distributed (p = 0.601).

```
[1] "#####"
[1] "
[1] "
[1] "Medium"
[1] "
[1] "
[1] "#####"
[1] "
[1] "
[1] "Modelo test"
```

```
[[1]]
```

Data: GLMMDB

Models:

DBNull: Medium ~ 1 + (1 | GrazingEnviroments)

```

DB: Medium ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 147.58 149.71 -70.791   141.58
DB        5 150.07 153.61 -70.037   140.07 1.5073  2    0.4706

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(2.3997) ( log )
Formula: Medium ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC logLik deviance df.resid
150.1    153.6   -70.0   140.1      10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-1.2593 -0.7014 -0.2248  0.5968  2.1572

Random effects:
      Groups             Name             Variance Std.Dev.
GrazingEnviroments (Intercept) 0.1075    0.3278
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      3.9319    0.3748  10.491  <2e-16 ***
BurningRegimeLow -0.5253    0.4214  -1.247    0.213
BurningRegimeHigh -0.1379    0.4842  -0.285    0.776
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.576
BrnnRgmHgh -0.651  0.464

[1] "Post hoc Test"
[[1]]

      Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

Fit: lme4::glmer(formula = Medium ~ BurningRegime + (1 | GrazingEnviroments),
      data = GLMMDB, family = MASS::negative.binomial(theta = 2.39970820054204))

Linear Hypotheses:
              Estimate Std. Error z value Pr(>|z|)
Low - Null == 0   -0.5253    0.4214  -1.247    0.425
High - Null == 0   -0.1379    0.4842  -0.285    0.956
High - Low == 0     0.3874    0.4718   0.821    0.689

```



(Adjusted p values reported -- single-step method)

```
[1] "Check Overdispersion"
[[1]]
# Overdispersion test
```

```
dispersion ratio = 0.897
p-value = 0.856
```

No overdispersion detected.

```
[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.968).
```

```
[1] "#####"
[1] "          "
[1] "          "
[1] "Large"
[1] "          "
[1] "          "
[1] "#####"
[1] "          "
[1] "          "
[1] "Modelo test"
[[1]]
```

Data: GLMMDB

Models:

DBNull: Large ~ 1 + (1 | GrazingEnviroments)

DB: Large ~ BurningRegime + (1 | GrazingEnviroments)

	npars	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
DBNull	3	88.232	90.356	-41.116	82.232			
DB	5	89.369	92.909	-39.684	79.369	2.8638	2	0.2389

```
[1] "Summary model"
```

```
[[1]]
```

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) [glmerMod]

Family: Negative Binomial(2.1578) ( log )

Formula: Large ~ BurningRegime + (1 | GrazingEnviroments)

Data: GLMMDB

	AIC	BIC	logLik	deviance	df.resid
	89.4	92.9	-39.7	79.4	10

Scaled residuals:

	Min	1Q	Median	3Q	Max
	-1.1839	-0.8534	-0.2960	0.5424	2.0719

Random effects:

Groups	Name	Variance	Std.Dev.
--------	------	----------	----------

```

GrazingEnviroments (Intercept) 6.633e-12 2.576e-06
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      2.1282     0.3413   6.235 4.51e-10 ***
BurningRegimeLow -0.7419     0.5091  -1.457   0.145
BurningRegimeHigh -0.7932     0.5117  -1.550   0.121
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.670
BrnnngRgmHgh -0.667  0.447
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

[1] "Post hoc Test"
[[1]]

      Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts


Fit: lme4::glmer(formula = Large ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 2.15776633444451))

Linear Hypotheses:
              Estimate Std. Error z value Pr(>|z|)
Low - Null == 0 -0.74194     0.50910  -1.457   0.311
High - Null == 0 -0.79323     0.51168  -1.550   0.267
High - Low == 0 -0.05129     0.53666  -0.096   0.995
(Adjusted p values reported -- single-step method)

[1] "Check Overdispersion"
[[1]]
# Overdispersion test

dispersion ratio = 0.800
p-value = 0.968

No overdispersion detected.

[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.748).

[1] "#####"
```

```

[1] "
[1] "
[1] "SmallTunn"
[1] "
[1] "
[1] "#####"
[1] "
[1] "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: SmallTunn ~ 1 + (1 | GrazingEnviroments)
DB: SmallTunn ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 116.00 118.12 -54.999   110.00
DB        5 113.37 116.91 -51.685   103.37 6.6269  2    0.03639 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(0.9515) ( log )
Formula: SmallTunn ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC logLik deviance df.resid
113.4    116.9   -51.7   103.4         10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-0.91909 -0.78646 -0.04519  0.39058  1.98316

Random effects:
Groups             Name      Variance Std.Dev.
GrazingEnviroments (Intercept) 1.364e-16 1.168e-08
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      2.8214     0.4713   5.987 2.14e-09 ***
BurningRegimeLow -1.7228     0.7064  -2.439  0.0147 *
BurningRegimeHigh  0.3975     0.6636   0.599  0.5491
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.667
BrnnRgmHgh -0.710  0.474
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

```

```

[1] "Post hoc Test"
[[1]]

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts


Fit: lme4::glmer(formula = SmallTunn ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 0.951478370110507))

Linear Hypotheses:
              Estimate Std. Error z value Pr(>|z|)
Low - Null == 0   -1.7228     0.7064  -2.439  0.03902 *
High - Null == 0    0.3975     0.6636   0.599  0.82050
High - Low == 0    2.1203     0.7036   3.013  0.00728 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- single-step method)


[1] "Check Overdispersion"
[[1]]
# Overdispersion test

dispersion ratio = 0.700
p-value = 0.968

No overdispersion detected.


[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.748).


[1] "#####"
[1] "          "
[1] "          "
[1] "MediumTunn"
[1] "          "
[1] "          "
[1] "#####"
[1] "          "
[1] "          "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: MediumTunn ~ 1 + (1 | GrazingEnviroments)
DB: MediumTunn ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)

```

```
DBNull    3 91.549 93.673 -42.774 85.549
DB         5 94.764 98.304 -42.382 84.764 0.7851 2 0.6753
```

```
[1] "Summary model"
```

```
[[1]]
```

```
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
```

```
Family: Negative Binomial(3.2305) ( log )
```

```
Formula: MediumTunn ~ BurningRegime + (1 | GrazingEnviroments)
```

```
Data: GLMMDB
```

AIC	BIC	logLik	deviance	df.resid
94.8	98.3	-42.4	84.8	10

```
Scaled residuals:
```

Min	1Q	Median	3Q	Max
-1.1312	-0.7306	-0.1517	0.8247	1.1888

```
Random effects:
```

Groups	Name	Variance	Std.Dev.
GrazingEnviroments	(Intercept)	0.6425	0.8015

Number of obs: 15, groups: GrazingEnviroments, 3

```
Fixed effects:
```

	Estimate	Std. Error	z value	Pr(> z )
(Intercept)	1.71198	0.58255	2.939	0.0033 **
BurningRegimeLow	-0.36131	0.46291	-0.781	0.4351
BurningRegimeHigh	0.08268	0.54066	0.153	0.8785

```
---
```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Correlation of Fixed Effects:
```

	(Intr)	BrnnRL
BurnngRgmLw	-0.378	
BrnnRgmHgh	-0.445	0.385

```
[1] "Post hoc Test"
```

```
[[1]]
```

```
Simultaneous Tests for General Linear Hypotheses
```

```
Multiple Comparisons of Means: Tukey Contrasts
```

```
Fit: lme4::glmer(formula = MediumTunn ~ BurningRegime + (1 | GrazingEnviroments),
data = GLMMDB, family = MASS::negative.binomial(theta = 3.23047590681067))
```

```
Linear Hypotheses:
```

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	-0.36131	0.46291	-0.781	0.714
High - Null == 0	0.08268	0.54066	0.153	0.987
High - Low == 0	0.44399	0.56030	0.792	0.706

(Adjusted p values reported -- single-step method)

```

[1] "Check Overdispersion"
[[1]]
# Overdispersion test

dispersion ratio = 0.533
p-value = 0.776

No overdispersion detected.

[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.700).

[1] "#####"
[1] " "
[1] " "
[1] "LargeTunn"
[1] " "
[1] " "
[1] "#####"
[1] " "
[1] " "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: LargeTunn ~ 1 + (1 | GrazingEnviroments)
DB: LargeTunn ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 64.837 66.961 -29.419   58.837
DB        5 63.266 66.806 -26.633   53.266 5.5714  2   0.06169 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(2.0294) ( log )
Formula: LargeTunn ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC logLik deviance df.resid
63.3    66.8   -26.6    53.3         10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-1.1697 -0.7575 -0.2601  0.2897  1.8938

Random effects:
Groups          Name          Variance Std.Dev.

```

```

GrazingEnviroments (Intercept) 1.728e-10 1.315e-05
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      1.4351     0.3823   3.754 0.000174 ***
BurningRegimeLow -1.6582     0.7034  -2.358 0.018395 *
BurningRegimeHigh -1.0986     0.6226  -1.765 0.077619 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.544
BrnnRgmHgh -0.614  0.334
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

[1] "Post hoc Test"
[[1]]

      Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts


Fit: lme4::glmer(formula = LargeTunn ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 2.02935855584673))

Linear Hypotheses:
              Estimate Std. Error z value Pr(>|z|)
Low - Null == 0  -1.6582     0.7034  -2.358  0.0478 *
High - Null == 0  -1.0986     0.6226  -1.765  0.1799
High - Low == 0   0.5596     0.7681   0.729  0.7450
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- single-step method)

[1] "Check Overdispersion"
[[1]]
# Overdispersion test

dispersion ratio = 1.104
p-value = 0.568

No overdispersion detected.

[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.941).

```

```

[1] "#####"
[1] " "
[1] " "
[1] "SmallRoll"
[1] " "
[1] " "
[1] "#####"
[1] " "
[1] " "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: SmallRoll ~ 1 + (1 | GrazingEnviroments)
DB: SmallRoll ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 84.480 86.604 -39.240   78.480
DB        5 87.064 90.605 -38.532   77.064 1.4154  2    0.4928

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(0.5907) ( log )
Formula: SmallRoll ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC logLik deviance df.resid
87.1      90.6   -38.5     77.1        10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-0.7500 -0.6753 -0.3377  0.2402  2.0259

Random effects:
      Groups             Name             Variance Std.Dev.
GrazingEnviroments (Intercept) 2.832e-10 1.683e-05
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      2.4681     0.5963   4.139 3.48e-05 ***
BurningRegimeLow -1.1872     0.8658  -1.371  0.1703
BurningRegimeHigh -1.7750     0.8911  -1.992  0.0464 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.689
BrnnRgmHgh -0.669  0.461
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

```



```
[1] "Post hoc Test"
[[1]]
```

#### Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

```
Fit: lme4::glmer(formula = SmallRoll ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 0.590703366069124))
```

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	-1.1872	0.8658	-1.371	0.356
High - Null == 0	-1.7750	0.8911	-1.992	0.114
High - Low == 0	-0.5878	0.9125	-0.644	0.796

(Adjusted p values reported -- single-step method)

```
[1] "Check Overdispersion"
[[1]]
```

# Overdispersion test

```
dispersion ratio = 0.654
p-value = 0.824
```

No overdispersion detected.

```
[1] "Check Residuals"
[[1]]
```

OK: Simulated residuals appear as uniformly distributed (p = 0.936).

```
[1] "#####"
[1] " "
[1] " "
[1] "MediumRoll"
[1] " "
[1] " "
[1] "#####"
[1] " "
[1] " "
[1] "Modelo test"
[[1]]
```

Data: GLMMDB

Models:

DBNull: MediumRoll ~ 1 + (1 | GrazingEnviroments)

DB: MediumRoll ~ BurningRegime + (1 | GrazingEnviroments)

	npar	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
DBNull	3	143.79	145.91	-68.895	137.79			
DB	5	146.68	150.22	-68.341	136.68	1.1079	2	0.5747

```
[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.7766) ( log )
Formula: MediumRoll ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB
```

AIC	BIC	logLik	deviance	df.resid
146.7	150.2	-68.3	136.7	10

Scaled residuals:

Min	1Q	Median	3Q	Max
-1.1979	-0.6364	-0.3585	0.4649	2.2339

Random effects:

Groups	Name	Variance	Std.Dev.
GrazingEnviroments	(Intercept)	2.713e-12	1.647e-06

Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:

	Estimate	Std. Error	z value	Pr(> z )
(Intercept)	3.8754	0.3417	11.343	<2e-16 ***
BurningRegimeLow	-0.5220	0.4861	-1.074	0.283
BurningRegimeHigh	-0.2537	0.4844	-0.524	0.600

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:

	(Intr) BrnnRL
BurnngRgmLw	-0.703
BrnnRgmHgh	-0.705 0.496

optimizer (Nelder\_Mead) convergence code: 0 (OK)  
boundary (singular) fit: see help('isSingular')

```
[1] "Post hoc Test"
```

```
[[1]]
```

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

```
Fit: lme4::glmer(formula = MediumRoll ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 1.77658804899776))
```

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	-0.5220	0.4861	-1.074	0.530
High - Null == 0	-0.2537	0.4844	-0.524	0.860
High - Low == 0	0.2683	0.4873	0.550	0.846

(Adjusted p values reported -- single-step method)

```

[1] "Check Overdispersion"
[[1]]
# Overdispersion test

dispersion ratio = 0.789
p-value = 0.88

No overdispersion detected.

[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.972).

[1] "#####"
[1] " "
[1] " "
[1] "LargeRoll"
[1] " "
[1] " "
[1] "#####"
[1] " "
[1] " "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: LargeRoll ~ 1 + (1 | GrazingEnviroments)
DB: LargeRoll ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 75.065 77.189 -34.532  69.065
DB        5 78.631 82.172 -34.316  68.631 0.4337  2    0.8051

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(0.6945) ( log )
Formula: LargeRoll ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC logLik deviance df.resid
78.6    82.2   -34.3    68.6         10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-0.7720 -0.7447 -0.2206  0.4698  1.6052

Random effects:
Groups          Name          Variance Std.Dev.
GrazingEnviroments (Intercept) 2.673e-16 1.635e-08

```

Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:

	Estimate	Std. Error	z value	Pr(> z )
(Intercept)	1.4351	0.5793	2.477	0.0132 *
BurningRegimeLow	-0.2719	0.8283	-0.328	0.7427
BurningRegimeHigh	-0.5596	0.8408	-0.666	0.5057

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:

(Intr) BrnnRL  
BurnngRgmLw -0.699  
BrnnRgmHgh -0.689 0.482  
optimizer (Nelder\_Mead) convergence code: 0 (OK)  
boundary (singular) fit: see help('isSingular')

[1] "Post hoc Test"  
[[1]]

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

Fit: lme4::glmer(formula = LargeRoll ~ BurningRegime + (1 | GrazingEnviroments),  
data = GLMMDB, family = MASS::negative.binomial(theta = 0.694488194851379))

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	-0.2719	0.8283	-0.328	0.942
High - Null == 0	-0.5596	0.8408	-0.666	0.783
High - Low == 0	-0.2877	0.8496	-0.339	0.939

(Adjusted p values reported -- single-step method)

[1] "Check Overdispersion"  
[[1]]  
# Overdispersion test

dispersion ratio = 0.758  
p-value = 0.888

No overdispersion detected.

[1] "Check Residuals"  
[[1]]  
OK: Simulated residuals appear as uniformly distributed (p = 0.849).

[1] "#####"  
[1] " "

```

[1] "
[1] "FeedStratC"
[1] "
[1] "
[1] "#####"
[1] "
[1] "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: FeedStratC ~ 1 + (1 | GrazingEnviroments)
DB: FeedStratC ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 140.02 142.14 -67.010   134.02
DB        5 137.10 140.64 -63.552   127.10 6.9166  2    0.03148 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(2.9638) ( log )
Formula: FeedStratC ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC  logLik deviance df.resid
137.1    140.6   -63.6    127.1        10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-1.4773 -0.6738  0.1103  0.5619  1.2635

Random effects:
Groups             Name      Variance Std.Dev.
GrazingEnviroments (Intercept) 0.02638  0.1624
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      3.3168     0.3100  10.699 <2e-16 ***
BurningRegimeLow -0.4854     0.4182  -1.160  0.2458
BurningRegimeHigh 0.7303     0.4049   1.804  0.0713 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.698
BrnnRgmHgh -0.630  0.448

[1] "Post hoc Test"
[[1]]

```

# Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

```
Fit: lme4::glmer(formula = FeedStratC ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 2.96375461550783))
```

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	-0.4854	0.4182	-1.160	0.4767
High - Null == 0	0.7303	0.4049	1.804	0.1682
High - Low == 0	1.2157	0.4324	2.811	0.0137 *

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
(Adjusted p values reported -- single-step method)

```
[1] "Check Overdispersion"
```

```
[[1]]
```

```
# Overdispersion test
```

```
dispersion ratio = 1.159
```

```
p-value = 0.44
```

No overdispersion detected.

```
[1] "Check Residuals"
```

```
[[1]]
```

OK: Simulated residuals appear as uniformly distributed (p = 0.596).

```
[1] "#####"
```

```
[1] " "
```

```
[1] " "
```

```
[1] "FeedStratN"
```

```
[1] " "
```

```
[1] " "
```

```
[1] "#####"
```

```
[1] " "
```

```
[1] " "
```

```
[1] "Modelo test"
```

```
[[1]]
```

```
Data: GLMMDB
```

```
Models:
```

```
DBNull: FeedStratN ~ 1 + (1 | GrazingEnviroments)
```

```
DB: FeedStratN ~ BurningRegime + (1 | GrazingEnviroments)
```

	npair	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
DBNull	3	132.47	134.59	-63.234	126.47			
DB	5	129.94	133.48	-59.969	119.94	6.5293	2	0.03821 *

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

```

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(0.9792) ( log )
Formula: FeedStratN ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC   logLik deviance df.resid
129.9    133.5    -60.0    119.9      10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-0.9252 -0.6505 -0.2995  0.4400  2.4551

Random effects:
Groups              Name      Variance Std.Dev.
GrazingEnviroments (Intercept) 8.98e-12 2.997e-06
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      3.9200     0.4563   8.591 < 2e-16 ***
BurningRegimeLow -0.8660     0.6495  -1.333  0.18245
BurningRegimeHigh -2.0031     0.6647  -3.013  0.00258 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.703
BrnnRgmHgh -0.686  0.482
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

[1] "Post hoc Test"
[[1]]

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

Fit: lme4::glmer(formula = FeedStratN ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 0.979177502253538))

Linear Hypotheses:
              Estimate Std. Error z value Pr(>|z|)
Low - Null == 0  -0.8660     0.6495  -1.333  0.37661
High - Null == 0  -2.0031     0.6647  -3.013  0.00729 **
High - Low == 0   -1.1371     0.6688  -1.700  0.20505
---

```

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
(Adjusted p values reported -- single-step method)

```
[1] "Check Overdispersion"
[[1]]
# Overdispersion test
```

```
dispersion ratio = 0.514
p-value = 0.744
```

No overdispersion detected.

```
[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.931).
```

```
[1] "#####"
[1] "          "
[1] "          "
[1] "FeedStratG"
[1] "          "
[1] "          "
[1] "#####"
[1] "          "
[1] "          "
[1] "Modelo test"
[[1]]
```

Data: GLMMDB

Models:

DBNull: FeedStratG ~ 1 + (1 | GrazingEnviroments)

DB: FeedStratG ~ BurningRegime + (1 | GrazingEnviroments)

	np	par	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
DBNull	3	104.77	106.89	-49.384	98.768				
DB	5	107.28	110.82	-48.641	97.282	1.486	2	0.4757	

```
[1] "Summary model"
[[1]]
```

Generalized linear mixed model fit by maximum likelihood (Laplace  
Approximation) [glmerMod]

Family: Negative Binomial(1.2183) ( log )

Formula: FeedStratG ~ BurningRegime + (1 | GrazingEnviroments)

Data: GLMMDB

	AIC	BIC	logLik	deviance	df.resid
	107.3	110.8	-48.6	97.3	10

Scaled residuals:

	Min	1Q	Median	3Q	Max
	-1.00643	-0.74664	-0.00392	0.47328	1.97585

Random effects:



```

Groups           Name          Variance Std.Dev.
GrazingEnviroments (Intercept) 0.3687  0.6072
Number of obs: 15, groups:  GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      2.23613    0.69961   3.196  0.00139 **
BurningRegimeLow -0.70872    0.66433  -1.067  0.28605
BurningRegimeHigh  0.04091    0.94027   0.044  0.96530
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.610
BrnnRgmHgh -0.742  0.564

[1] "Post hoc Test"
[[1]]

      Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts


Fit: lme4::glmer(formula = FeedStratG ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 1.21829086059557))

Linear Hypotheses:
              Estimate Std. Error z value Pr(>|z|)
Low - Null == 0 -0.70872    0.66433  -1.067  0.528
High - Null == 0  0.04091    0.94027   0.044  0.999
High - Low == 0   0.74963    0.78756   0.952  0.601
(Adjusted p values reported -- single-step method)


[1] "Check Overdispersion"
[[1]]
# Overdispersion test

dispersion ratio = 0.764
p-value = 0.752

No overdispersion detected.


[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.698).

[1] "#####"
[1] "      "
[1] "      "

```

```

[1] "HabPrefS"
[1] "
[1] "
[1] "#####"
[1] "
[1] "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: HabPrefS ~ 1 + (1 | GrazingEnviroments)
DB: HabPrefS ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 140.92 143.05 -67.462   134.92
DB        5 138.16 141.70 -64.079   128.16 6.7656  2    0.03395 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(3.179) ( log )
Formula: HabPrefS ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC   logLik deviance df.resid
138.2    141.7    -64.1    128.2        10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-1.45759 -0.53575 -0.02232  0.20201  1.89520

Random effects:
Groups           Name      Variance Std.Dev.
GrazingEnviroments (Intercept) 0.03572  0.189
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      3.3290     0.3100  10.739 <2e-16 ***
BurningRegimeLow -0.3914     0.4079  -0.960  0.3372
BurningRegimeHigh 0.7511     0.3959   1.897  0.0578 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.691
BrnnRgmHgh -0.645  0.474

[1] "Post hoc Test"
[[1]]

```

## Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

```
Fit: lme4::glmer(formula = HabPrefS ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 3.17898723183185))
```

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	-0.3914	0.4079	-0.960	0.6024
High - Null == 0	0.7511	0.3959	1.897	0.1396
High - Low == 0	1.1425	0.4122	2.772	0.0154 *

```
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- single-step method)
```

```
[1] "Check Overdispersion"
[[1]]
# Overdispersion test
```

```
dispersion ratio = 1.363
p-value = 0.416
```

No overdispersion detected.

```
[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.654).
```

```
[1] "#####"
[1] " "
[1] " "
[1] "HabPrefG"
[1] " "
[1] " "
[1] "#####"
[1] " "
[1] " "
[1] "Modelo test"
[[1]]
```

Data: GLMMDB

Models:

```
DBNull: HabPrefG ~ 1 + (1 | GrazingEnviroments)
DB: HabPrefG ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 140.69 142.81 -67.345   134.69
DB        5 139.62 143.16 -64.810   129.62 5.0699  2    0.07927 .
---
```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(0.9807) ( log )
Formula: HabPrefG ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC   logLik deviance df.resid
139.6    143.2    -64.8    129.6      10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-0.9719 -0.6693 -0.2787  0.2069  2.3310

Random effects:
Groups              Name      Variance Std.Dev.
GrazingEnviroments (Intercept) 3.651e-15 6.043e-08
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      4.1836     0.4549   9.196 < 2e-16 ***
BurningRegimeLow -0.9410     0.6471  -1.454  0.14590
BurningRegimeHigh -1.7155     0.6541  -2.623  0.00873 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.703
BrnnRgmHgh -0.696  0.489
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

[1] "Post hoc Test"
[[1]]

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

Fit: lme4::glmer(formula = HabPrefG ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 0.980729383761348))

Linear Hypotheses:
              Estimate Std. Error z value Pr(>|z|)
Low - Null == 0  -0.9410     0.6471  -1.454  0.3132
High - Null == 0 -1.7155     0.6541  -2.623  0.0237 *
High - Low == 0  -0.7745     0.6577  -1.178  0.4666
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

(Adjusted p values reported -- single-step method)

```
[1] "Check Overdispersion"
[[1]]
# Overdispersion test
```

```
dispersion ratio = 0.447
p-value = 0.6
```

No overdispersion detected.

```
[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.975).
```

```
[1] "#####"
[1] " "
[1] " "
[1] "TempSegregD"
[1] " "
[1] " "
[1] "#####"
[1] " "
[1] " "
[1] "Modelo test"
[[1]]
```

Data: GLMMDB

Models:

DBNull: TempSegregD ~ 1 + (1 | GrazingEnviroments)

DB: TempSegregD ~ BurningRegime + (1 | GrazingEnviroments)

	npar	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
DBNull	3	153.59	155.72	-73.797	147.59			
DB	5	155.38	158.92	-72.691	145.38	2.2111	2	0.331

```
[1] "Summary model"
```

```
[[1]]
```

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) [glmerMod]

Family: Negative Binomial(2.152) ( log )

Formula: TempSegregD ~ BurningRegime + (1 | GrazingEnviroments)

Data: GLMMDB

AIC	BIC	logLik	deviance	df.resid
155.4	158.9	-72.7	145.4	10

Scaled residuals:

Min	1Q	Median	3Q	Max
-1.2710	-0.7458	-0.3249	0.5964	1.9489

Random effects:

Groups	Name	Variance	Std.Dev.
--------	------	----------	----------

```

GrazingEnviroments (Intercept) 0.1134 0.3367
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      4.1739      0.4199   9.939  <2e-16 ***
BurningRegimeLow -0.6861      0.4472  -1.534   0.125
BurningRegimeHigh -0.2614      0.5745  -0.455   0.649
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.590
BrnnRgmHgh -0.713 0.480

[1] "Post hoc Test"
[[1]]

Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts


Fit: lme4::glmer(formula = TempSegregD ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 2.15195024492772))

Linear Hypotheses:
              Estimate Std. Error z value Pr(>|z|)
Low - Null == 0  -0.6861      0.4472  -1.534   0.272
High - Null == 0 -0.2614      0.5745  -0.455   0.891
High - Low == 0   0.4247      0.5322   0.798   0.702
(Adjusted p values reported -- single-step method)


[1] "Check Overdispersion"
[[1]]
# Overdispersion test

dispersion ratio = 0.874
p-value = 0.848

No overdispersion detected.


[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.993).

[1] "#####"
[1] "          "
[1] "          "
[1] "TempSegregN"

```

```

[1] "
[1] "
[1] "#####"
[1] "
[1] "
[1] "Modelo test"
[[1]]
Data: GLMMDB
Models:
DBNull: TempSegregN ~ 1 + (1 | GrazingEnviroments)
DB: TempSegregN ~ BurningRegime + (1 | GrazingEnviroments)
      npar    AIC    BIC logLik deviance Chisq Df Pr(>Chisq)
DBNull   3 119.65 121.78 -56.825   113.65
DB        5 116.48 120.02 -53.241   106.48 7.1693  2    0.02775 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(2.1289) ( log )
Formula: TempSegregN ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC   logLik deviance df.resid
116.5    120.0   -53.2    106.5         10

Scaled residuals:
      Min       1Q   Median       3Q      Max
-1.2441 -0.7580  0.0000  0.6132  2.1054

Random effects:
Groups             Name      Variance Std.Dev.
GrazingEnviroments (Intercept) 0         0
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      2.7726    0.3263   8.498  <2e-16 ***
BurningRegimeLow -0.9808    0.4835  -2.029   0.0425 *
BurningRegimeHigh 0.5008    0.4560   1.098   0.2722
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.675
BrnnRgmHgh -0.715  0.483
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

[1] "Post hoc Test"

```

```
[[1]]
```

### Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts

```
Fit: lme4::glmer(formula = TempSegregN ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 2.1288796511295))
```

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
Low - Null == 0	-0.9808	0.4835	-2.029	0.10523
High - Null == 0	0.5008	0.4560	1.098	0.51505
High - Low == 0	1.4816	0.4783	3.097	0.00554 **

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
(Adjusted p values reported -- single-step method)

```
[1] "Check Overdispersion"
```

```
[[1]]
```

# Overdispersion test

```
dispersion ratio = 1.398
p-value = 0.4
```

No overdispersion detected.

```
[1] "Check Residuals"
```

```
[[1]]
```

OK: Simulated residuals appear as uniformly distributed (p = 0.976).

```
[1] "#####"
```

```
[1] " "
```

```
[1] " "
```

```
[1] "TempSegregC"
```

```
[1] " "
```

```
[1] " "
```

```
[1] "#####"
```

```
[1] " "
```

```
[1] " "
```

```
[1] "Modelo test"
```

```
[[1]]
```

Data: GLMMDB

Models:

DBNull: TempSegregC ~ 1 + (1 | GrazingEnviroments)

DB: TempSegregC ~ BurningRegime + (1 | GrazingEnviroments)

	npars	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
DBNull	3	53.07	55.194	-23.535	47.07			
DB	5	54.22	57.760	-22.110	44.22	2.8497	2	0.2405



```

[1] "Summary model"
[[1]]
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(0.9821) ( log )
Formula: TempSegregC ~ BurningRegime + (1 | GrazingEnviroments)
Data: GLMMDB

      AIC      BIC   logLik deviance df.resid
    54.2    57.8   -22.1    44.2      10

Scaled residuals:
    Min      1Q  Median      3Q      Max
-0.8443 -0.6103 -0.1948  0.1660  2.4411

Random effects:
 Groups              Name              Variance Std.Dev.
 GrazingEnviroments (Intercept) 8.517e-12 2.918e-06
Number of obs: 15, groups: GrazingEnviroments, 3

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    -0.5108    0.7328  -0.697   0.486
BurningRegimeLow  0.2877    0.9953   0.289   0.773
BurningRegimeHigh 1.4663    0.9042   1.622   0.105

Correlation of Fixed Effects:
      (Intr) BrnnRL
BurnngRgmLw -0.736
BrnnRgmHgh -0.810  0.597
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')

[1] "Post hoc Test"
[[1]]

      Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Tukey Contrasts


Fit: lme4::glmer(formula = TempSegregC ~ BurningRegime + (1 | GrazingEnviroments),
  data = GLMMDB, family = MASS::negative.binomial(theta = 0.982088088336003))

Linear Hypotheses:
              Estimate Std. Error z value Pr(>|z|)
Low - Null == 0  0.2877    0.9953   0.289   0.955
High - Null == 0  1.4663    0.9042   1.622   0.235
High - Low == 0  1.1787    0.8569   1.376   0.353
(Adjusted p values reported -- single-step method)

[1] "Check Overdispersion"

```

```
[[1]]
# Overdispersion test

dispersion ratio = 1.229
p-value = 0.48

No overdispersion detected.

[1] "Check Residuals"
[[1]]
OK: Simulated residuals appear as uniformly distributed (p = 0.661).
```