cardiac analysis

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```
## Analysis of Variance Table
##
## Response: Diastolic_LV_Volume
##                                   Df Sum Sq Mean Sq F value  Pr(>F)
## factor(Sex)                        1  381.6  381.58  3.2530 0.13115
## Age                                1  111.8  111.76  0.9528 0.37385
## Mass                               1  178.2  178.16  1.5189 0.27258
## factor(Diet)                       1  746.8  746.83  6.3669 0.05296 .
## factor(Genotype)                   5 5483.3 1096.66  9.3493 0.01416 *
## factor(Sex):Age                    1  131.6  131.58  1.1217 0.33801
## factor(Sex):Mass                   1   28.5   28.50  0.2430 0.64295
## Age:Mass                           1    0.1    0.09  0.0008 0.97905
## factor(Sex):factor(Diet)           1    5.9    5.93  0.0505 0.83105
## Mass:factor(Diet)                  1  207.9  207.93  1.7726 0.24053
## factor(Sex):factor(Genotype)       3  496.6  165.54  1.4113 0.34274
## Age:factor(Genotype)               2   66.1   33.07  0.2819 0.76559
## Mass:factor(Genotype)              3  346.4  115.45  0.9843 0.47059
## factor(Sex):Age:Mass               1  246.5  246.45  2.1011 0.20688
## factor(Sex):Age:factor(Genotype)   2  126.9   63.45  0.5409 0.61284
## factor(Sex):Mass:factor(Genotype)  1    0.6    0.61  0.0052 0.94515
## Age:Mass:factor(Genotype)          1    0.0    0.00  0.0000 0.99842
## Residuals                          5  586.5  117.30
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
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```
## Analysis of Variance Table
##
## Response: Systolic_LV_Volume
##                                   Df Sum Sq Mean Sq F value   Pr(>F)
## factor(Sex)                        1  379.3  379.27 11.2833 0.020128 *
## Age                                1  164.3  164.32  4.8885 0.078008 .
## Mass                               1   21.2   21.24  0.6319 0.462697
## factor(Diet)                       1  402.4  402.44 11.9727 0.018039 *
## factor(Genotype)                   5 3663.2  732.65 21.7963 0.002087 **
## factor(Sex):Age                    1   76.3   76.26  2.2687 0.192363
## factor(Sex):Mass                   1   97.0   97.01  2.8860 0.150104
## Age:Mass                           1    0.2    0.15  0.0046 0.948569
## factor(Sex):factor(Diet)           1   13.3   13.33  0.3965 0.556532
## Mass:factor(Diet)                  1   16.2   16.17  0.4811 0.518824
## factor(Sex):factor(Genotype)       3  106.7   35.55  1.0578 0.444584
## Age:factor(Genotype)               2   38.1   19.07  0.5673 0.599729
## Mass:factor(Genotype)              3  518.8  172.95  5.1452 0.054773 .
## factor(Sex):Age:Mass               1   27.2   27.15  0.8078 0.409957
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## factor(Sex):Age:factor(Genotype)   2  141.9   70.96  2.1111 0.216442
## factor(Sex):Mass:factor(Genotype)  1    3.6    3.58  0.1066 0.757314
## Age:Mass:factor(Genotype)          1  120.4  120.39  3.5817 0.116979
## Residuals                          5  168.1   33.61
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

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## Analysis of Variance Table
##
## Response: Stroke_Volume
##                                   Df Sum Sq Mean Sq F value Pr(>F)
## factor(Sex)                        1   0.00   0.003  0.0000 0.9956
## Age                                1   5.05   5.049  0.0494 0.8328
## Mass                               1  76.37  76.369  0.7477 0.4267
## factor(Diet)                       1  52.81  52.813  0.5171 0.5043
## factor(Genotype)                   5 210.66  42.133  0.4125 0.8233
## factor(Sex):Age                    1   7.50   7.497  0.0734 0.7973
## factor(Sex):Mass                   1  20.35  20.347  0.1992 0.6740
## Age:Mass                           1   0.01   0.009  0.0001 0.9929
## factor(Sex):factor(Diet)           1   1.48   1.480  0.0145 0.9089
## Mass:factor(Diet)                  1 108.13 108.126  1.0587 0.3507
## factor(Sex):factor(Genotype)       3 148.29  49.430  0.4840 0.7079
## Age:factor(Genotype)               2   9.31   4.654  0.0456 0.9558
## Mass:factor(Genotype)              3  39.17  13.058  0.1279 0.9395
## factor(Sex):Age:Mass               1 110.00 109.996  1.0770 0.3469
## factor(Sex):Age:factor(Genotype)   2  11.72   5.859  0.0574 0.9449
## factor(Sex):Mass:factor(Genotype)  1   7.16   7.160  0.0701 0.8018
## Age:Mass:factor(Genotype)          1 120.89 120.888  1.1836 0.3263
## Residuals                          5 510.67 102.134
```

```
## Analysis of Variance Table
##
## Response: Ejection_Fraction
##                                   Df  Sum Sq Mean Sq F value Pr(>F)
## factor(Sex)                        1  319.50  319.50  1.6690 0.2529
## Age                                1  291.36  291.36  1.5220 0.2721
## Mass                               1    2.18    2.18  0.0114 0.9191
## factor(Diet)                       1    3.33    3.33  0.0174 0.9003
## factor(Genotype)                   5 1528.93  305.79  1.5974 0.3099
## factor(Sex):Age                    1   83.28   83.28  0.4351 0.5387
## factor(Sex):Mass                   1  165.25  165.25  0.8632 0.3955
## Age:Mass                           1   15.30   15.30  0.0799 0.7887
## factor(Sex):factor(Diet)           1    0.55    0.55  0.0029 0.9595
## Mass:factor(Diet)                  1  202.42  202.42  1.0574 0.3510
## factor(Sex):factor(Genotype)       3   45.26   15.09  0.0788 0.9687
## Age:factor(Genotype)               2   28.20   14.10  0.0737 0.9300
## Mass:factor(Genotype)              3  669.09  223.03  1.1651 0.4099
## factor(Sex):Age:Mass               1   57.30   57.30  0.2993 0.6078
## factor(Sex):Age:factor(Genotype)   2  196.60   98.30  0.5135 0.6269
## factor(Sex):Mass:factor(Genotype)  1   24.58   24.58  0.1284 0.7347
## Age:Mass:factor(Genotype)          1  527.30  527.30  2.7545 0.1579
## Residuals                          5  957.15  191.43
```

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## Analysis of Variance Table
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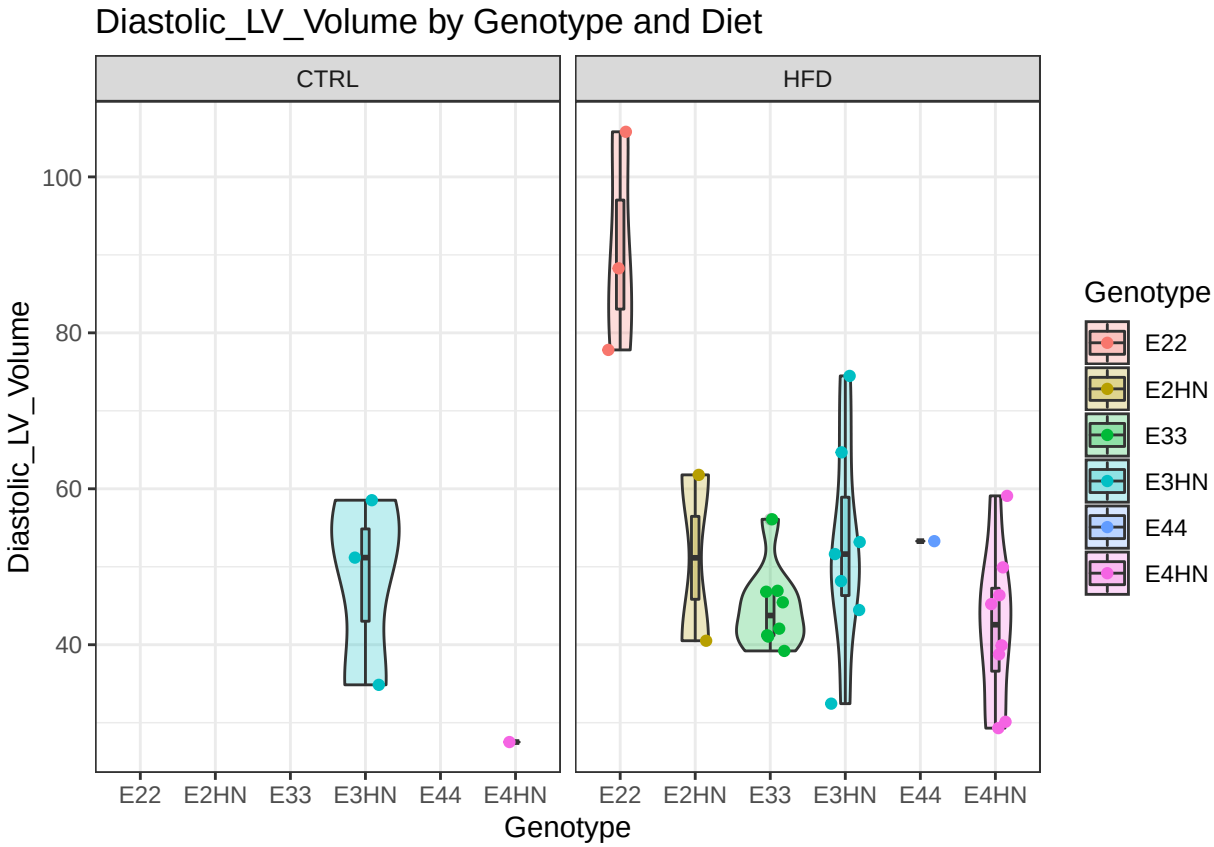
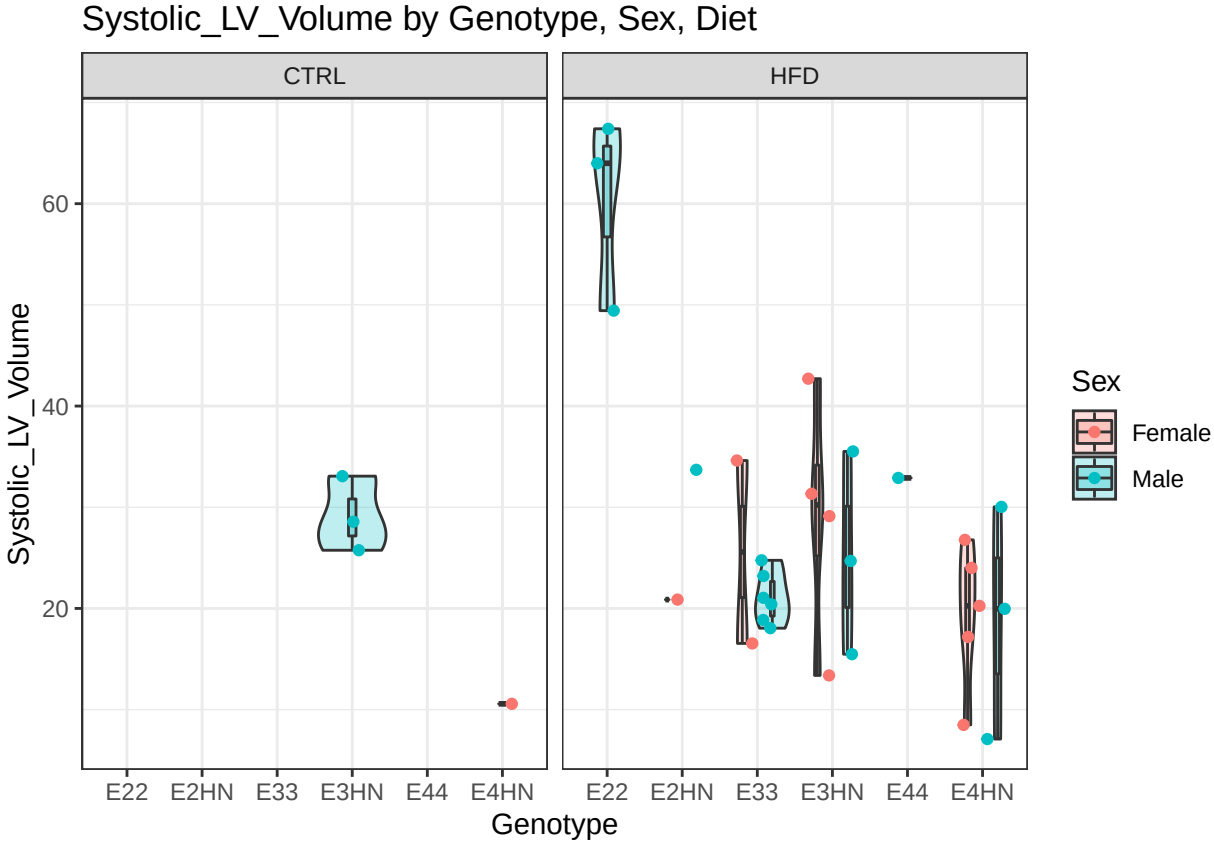
```
## Response: Heart_Rate
##                                    Df  Sum Sq Mean Sq F value  Pr(>F)
## factor(Sex)                         1   384.8   384.8  0.1611 0.70477
## Age                                 1 10075.2 10075.2  4.2164 0.09523 .
## Mass                                1   257.8   257.8  0.1079 0.75585
## factor(Diet)                        1     0.2     0.2  0.0001 0.99249
## factor(Genotype)                    5  3889.0   777.8  0.3255 0.87826
## factor(Sex):Age                     1   890.8   890.8  0.3728 0.56817
## factor(Sex):Mass                    1    81.4    81.4  0.0341 0.86080
## Age:Mass                            1    70.0    70.0  0.0293 0.87080
## factor(Sex):factor(Diet)            1  1623.3  1623.3  0.6793 0.44733
## Mass:factor(Diet)                   1   575.0   575.0  0.2406 0.64452
## factor(Sex):factor(Genotype)        3  2629.1   876.4  0.3668 0.78075
## Age:factor(Genotype)                2  2877.2  1438.6  0.6020 0.58308
## Mass:factor(Genotype)               3  2665.9   888.6  0.3719 0.77743
## factor(Sex):Age:Mass                1     8.1     8.1  0.0034 0.95579
## factor(Sex):Age:factor(Genotype)    2  3197.0  1598.5  0.6690 0.55278
## factor(Sex):Mass:factor(Genotype)   1     2.3     2.3  0.0010 0.97646
## Age:Mass:factor(Genotype)           1   171.7   171.7  0.0719 0.79936
## Residuals                           5 11947.6  2389.5
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## Analysis of Variance Table
##
## Response: Cardiac_Output
##                                    Df  Sum Sq Mean Sq F value Pr(>F)
## factor(Sex)                         1   0.002  0.0021  0.0001 0.9932
## Age                                 1   1.397  1.3971  0.0534 0.8264
## Mass                                1  17.196 17.1957  0.6574 0.4543
## factor(Diet)                        1  12.891 12.8914  0.4928 0.5140
## factor(Genotype)                    5  42.932  8.5865  0.3283 0.8766
## factor(Sex):Age                     1   3.191  3.1911  0.1220 0.7411
## factor(Sex):Mass                    1   4.414  4.4142  0.1688 0.6982
## Age:Mass                            1   0.020  0.0204  0.0008 0.9788
## factor(Sex):factor(Diet)            1   0.105  0.1054  0.0040 0.9518
## Mass:factor(Diet)                   1  15.623 15.6232  0.5973 0.4745
## factor(Sex):factor(Genotype)        3  28.187  9.3956  0.3592 0.7856
## Age:factor(Genotype)                2   0.922  0.4609  0.0176 0.9826
## Mass:factor(Genotype)               3  12.297  4.0989  0.1567 0.9210
## factor(Sex):Age:Mass                1  22.119 22.1193  0.8456 0.4000
## factor(Sex):Age:factor(Genotype)    2   7.351  3.6753  0.1405 0.8722
## factor(Sex):Mass:factor(Genotype)   1   1.061  1.0609  0.0406 0.8483
## Age:Mass:factor(Genotype)           1  27.112 27.1120  1.0365 0.3553
## Residuals                           5 130.788 26.1575
```






```
## Analysis of Variance Table
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```
##
## Response: Diastolic_LV_Volume
##                  Df Sum Sq Mean Sq F value    Pr(>F)
## factor(Genotype)  5 5967.2  1193.4  10.139 1.506e-05 ***
## Residuals        27 3178.0   117.7
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
## $`emmeans of Genotype`
##  Genotype emmean    SE df lower.CL upper.CL
##  E22        90.6  6.26 27     77.8    103.5
##  E2HN       51.1  7.67 27     35.4     66.9
##  E33        44.8  3.84 27     37.0     52.7
##  E3HN       51.4  3.43 27     44.3     58.4
##  E44        53.3 10.85 27     31.0     75.5
##  E4HN       40.7  3.62 27     33.3     48.1
##
## Confidence level used: 0.95
##
## $`pairwise differences of Genotype`
##  1           estimate    SE df t.ratio p.value
##  E22 - E2HN    39.475  9.90 27   3.986  0.0055
##  E22 - E33     45.776  7.34 27   6.232  <.0001
##  E22 - E3HN    39.265  7.14 27   5.498  0.0001
##  E22 - E44     37.340 12.53 27   2.981  0.0600
##  E22 - E4HN    49.933  7.23 27   6.904  <.0001
##  E2HN - E33     6.301  8.58 27   0.735  0.9757
##  E2HN - E3HN   -0.209  8.40 27  -0.025  1.0000
##  E2HN - E44    -2.135 13.29 27  -0.161  1.0000
##  E2HN - E4HN   10.458  8.48 27   1.233  0.8169
##  E33 - E3HN    -6.511  5.15 27  -1.265  0.8007
##  E33 - E44     -8.436 11.51 27  -0.733  0.9760
##  E33 - E4HN     4.157  5.27 27   0.788  0.9671
##  E3HN - E44    -1.925 11.38 27  -0.169  1.0000
##  E3HN - E4HN   10.667  4.98 27   2.140  0.2979
##  E44 - E4HN    12.593 11.44 27   1.101  0.8766
##
## P value adjustment: tukey method for comparing a family of 6 estimates
```

```
## Analysis of Variance Table
##
## Response: Systolic_LV_Volume
##                  Df Sum Sq Mean Sq F value    Pr(>F)
## factor(Genotype)  5 4237.8  847.56  13.302 1.388e-06 ***
## Residuals        27 1720.4   63.72
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
## $`emmeans of Genotype`
##  Genotype emmean   SE df lower.CL upper.CL
##  E22        60.3 4.61 27     50.8     69.7
##  E2HN       27.3 5.64 27     15.7     38.9
##  E33        22.2 2.82 27     16.4     28.0
##  E3HN       28.0 2.52 27     22.8     33.1
##  E44        32.9 7.98 27     16.5     49.3
```

```
##  E4HN       18.3 2.66 27     12.8     23.7
##
## Confidence level used: 0.95
##
## $`pairwise differences of Genotype`
##  1           estimate   SE df t.ratio p.value
##  E22 - E2HN    32.989 7.29 27   4.527  0.0014
##  E22 - E33     38.087 5.40 27   7.048  <.0001
##  E22 - E3HN    32.312 5.25 27   6.149  <.0001
##  E22 - E44     27.378 9.22 27   2.970  0.0614
##  E22 - E4HN    42.010 5.32 27   7.894  <.0001
##  E2HN - E33     5.099 6.31 27   0.808  0.9636
##  E2HN - E3HN   -0.676 6.18 27  -0.109  1.0000
##  E2HN - E44    -5.610 9.78 27  -0.574  0.9920
##  E2HN - E4HN    9.021 6.24 27   1.446  0.6998
##  E33 - E3HN    -5.775 3.79 27  -1.525  0.6517
##  E33 - E44    -10.709 8.47 27  -1.265  0.8009
##  E33 - E4HN     3.923 3.88 27   1.011  0.9101
##  E3HN - E44    -4.934 8.37 27  -0.589  0.9909
##  E3HN - E4HN    9.698 3.67 27   2.644  0.1208
##  E44 - E4HN    14.632 8.41 27   1.739  0.5195
##
## P value adjustment: tukey method for comparing a family of 6 estimates
```