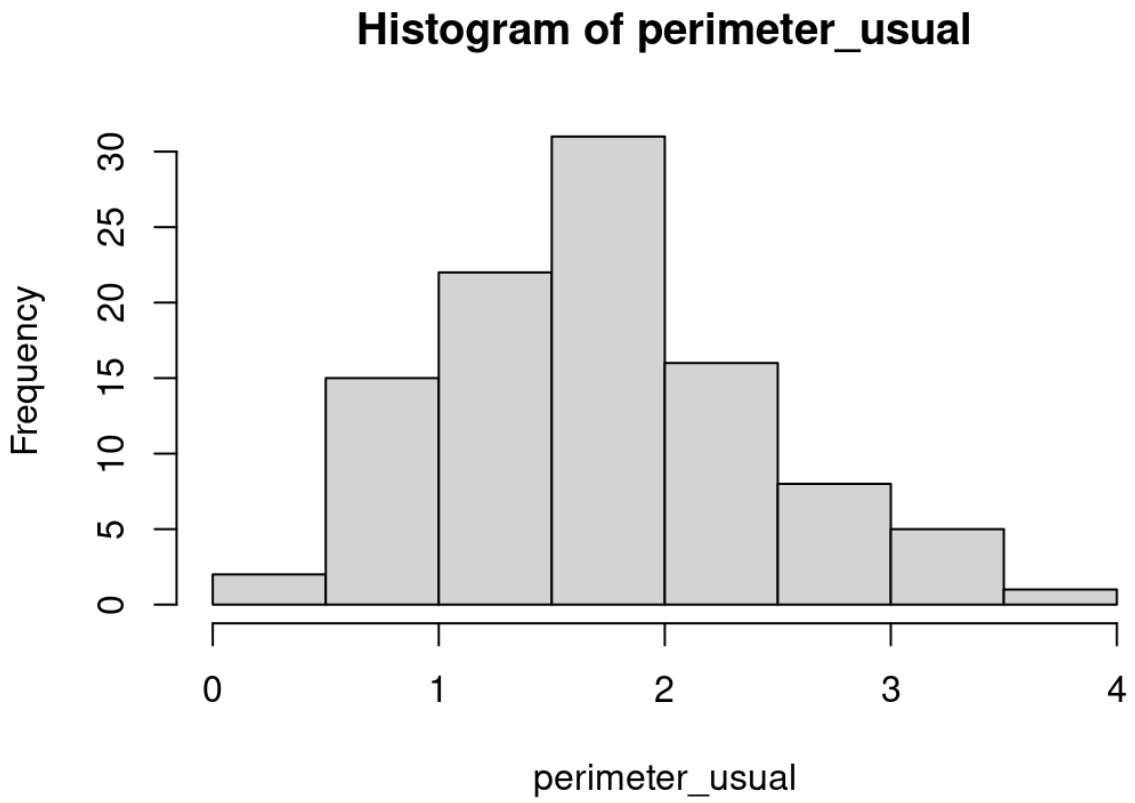
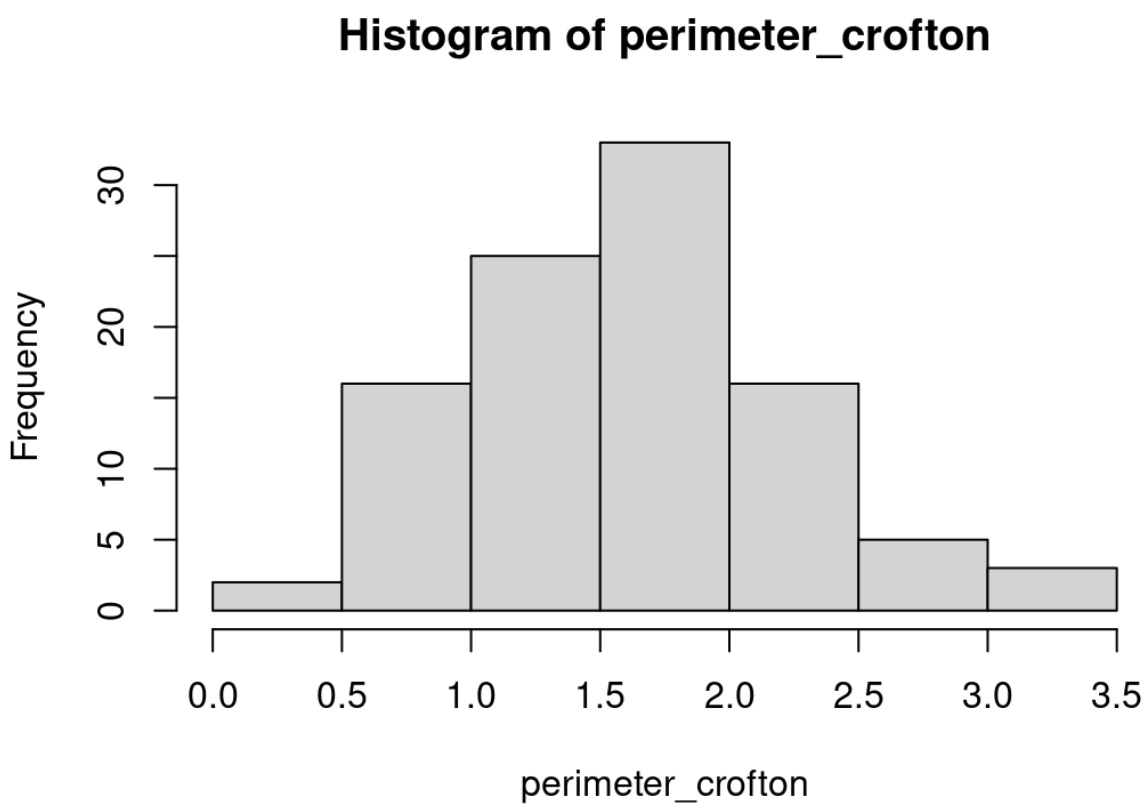
Spočítali jsme perimeter mitochondrií dvěma různými metodami a chceme porovnat výsledky.

```
> perimeter_usual = c(3.492756050848081, 0.0943552060097428, 1.1686475457949477, 2.3657775
18633738, 1.248857413463238, 1.5727785171899855, 1.7732073111802429, 2.748211106614252, 0.
9383475457949476, 2.5885583727214234, 0.8433376631022999, 1.9126966645460524, 2.1372497983
21514, 2.448222592311771, 1.917167076565538, 0.058461139843888, 1.785772120194857, 3.03000
02704384283, 2.593842312623995, 2.2248993863020283, 1.6156774585363094, 0.905123530770590
4, 1.8289422375022093, 1.241880619472981, 1.5006630465168236, 3.110210138106719, 1.4171003
69833919, 1.2196408841364, 2.176141253970319, 2.066139605892376, 1.874459885580152, 1.5913
942675509236, 1.1313366194729808, 2.5478665561946303, 0.8612987367803332, 1.33214891418511
42, 2.374143091589895, 3.059487975726295, 2.0960108119021186, 1.8176867818534048, 1.522902
7818534049, 2.027631650965448, 1.2241112961558858, 1.5357387668290476, 1.830443341228957,
 2.2309503276483524, 0.7570768540876857, 0.6708160450730712, 0.9871056781266572, 1.1097515
608193047, 1.7120761201948569, 2.945319990750652, 0.6231755157462334, 1.9515086945947664,
 1.099693133775462, 1.7951758705557952, 0.9972435307705904, 2.5023769893069, 1.31511369315
1014, 1.2717518254827238, 1.5859980028875045, 2.6220535637068094, 1.7419473262046, 1.00441
20751217858, 0.8076072661071715, 2.523962047960576, 1.2776110164681094, 1.259187016468109
4, 2.0436286945947666, 1.2901758254827238, 1.4103153262046, 0.9588150014437522, 1.04842861
9472981, 0.5759979127413619, 1.7414843998826333, 1.8619745021656289, 0.6442976480779429,
 1.7331982525265666, 1.508565693151014, 1.871107076565538, 2.474086312623995, 0.9334142074
534952, 1.8971625472387, 2.089034017911862, 1.846169208897248, 1.6750363698339188, 3.65213
7608779881, 3.2160919757262945, 1.6399606495216952, 1.811172914185114, 2.2889998855801523,
2.112854282575281, 1.4750705021656283, 1.5833792961558857, 1.4730270465168236, 2.055538826
9264765, 1.6853659728387902, 1.3551227518046904, 0.6128459127413618, 1.3746643548095618)
> hist(perimeter_usual)
```




```
> perimeter_crofton = c(3.3236914445330017, 0.1018054122014146, 1.1202984158892777, 2.2552
487982825205, 1.1963421388327151, 1.5034386019411703, 1.6934570139289984, 2.61781857497038
1, 0.9019603247918276, 2.4664582920496283, 0.8118853077596725, 1.8257012134179629, 2.03859
09336892816, 2.333411629403886, 1.8299394297738183, 0.1158367062901324, 1.705369199839788
4, 2.884971454350829, 2.4714677812020422, 2.121687953772406, 1.5441093486352988, 0.8704619
834153139, 1.746297037466103, 1.1897277233667451, 1.4350688485526668, 2.9610151772942666,
 1.3558464633423375, 1.1686431321383404, 2.075462345701271, 1.9711742438388675, 1.78945047
3821221, 1.5210874399704968, 1.084925439639969, 2.428784416880861, 0.8289134733737517, 1.2
75307433110858, 2.263179858769641, 2.9129275519773903, 1.9994939229484896, 1.7356261963858
075, 1.4561534397810716, 1.9346664133099387, 1.1728813484941965, 1.468322716624048, 1.7477
201730381278, 2.1274246058909427, 0.7301049326976985, 0.6483245576357246, 0.94818593286296
24, 1.0644615208268116, 1.635501010688604, 2.804689515051536, 0.6031585036535537, 1.862497
325239297, 1.054925534026136, 1.7142845142252168, 0.9577972198542938, 2.38475321717831, 1.
2591570308442124, 1.218047402476367, 1.5159714602672074, 2.498213724358328, 1.663820689798
226, 0.9645934260617944, 0.7780107672730444, 2.405217135991468, 1.223602263853373, 1.20613
5216565577, 1.9498325616782768, 1.235514449764163, 1.349413838617898, 0.9213646895160212,
 1.006323726844887, 0.5584313313450997, 1.6633818081245093, 1.7776135881010866, 0.62318354
07929944, 1.655526047828045, 1.4425610273660705, 1.7862718115543288, 2.3579319738313687,
 0.897283226762255, 1.810973946723342, 1.99287950748252, 1.7626292304742792, 1.60038512537
14818, 3.474794636521568, 3.0613974539236564, 1.5671312573001008, 1.7294506625935544, 2.18
2459037796631, 2.015462534473605, 1.4108055950573704, 1.5134887706062183, 1.40886827762097
29, 1.9611240751738197, 1.6101782031043437, 1.2970879969451656, 0.5933654259206919, 1.3156
```

```
145983219256)
> hist(perimeter_crofton)
```



Test hypotézy

$$H_0 = \mu_{m1} = \mu_{m2}$$

$$H_A = \mu_{m1} > \mu_{m2}$$

```
> t.test(perimeter_usual, perimeter_crofton,
+        alternative = "greater", paired = TRUE)

  Paired t-test

data:  perimeter_usual and perimeter_crofton
t = 19.807, df = 99, p-value < 2.2e-16
alternative hypothesis: true difference in means is greater than 0
95 percent confidence interval:
```

```
 0.06893386        Inf
sample estimates:
mean of the differences
             0.07524129
```

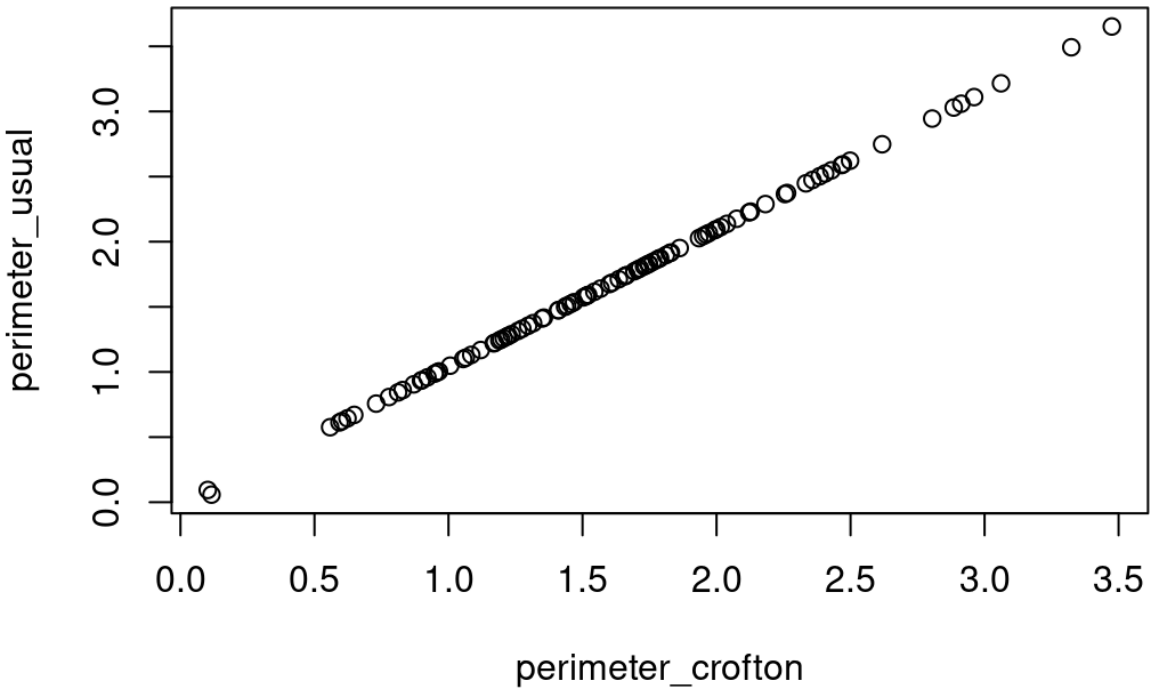
```
> t.test(perimeter_usual, perimeter_crofton,alternative = "two.sided", paired = TRUE)

  Paired t-test

data:  perimeter_usual and perimeter_crofton
t = 19.807, df = 99, p-value < 2.2e-16
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 0.06770373 0.08277886
sample estimates:
mean of the differences
             0.07524129

> mean(perimeter_crofton)
[1] 1.620582
> mean(perimeter_usual)
[1] 1.695824
```

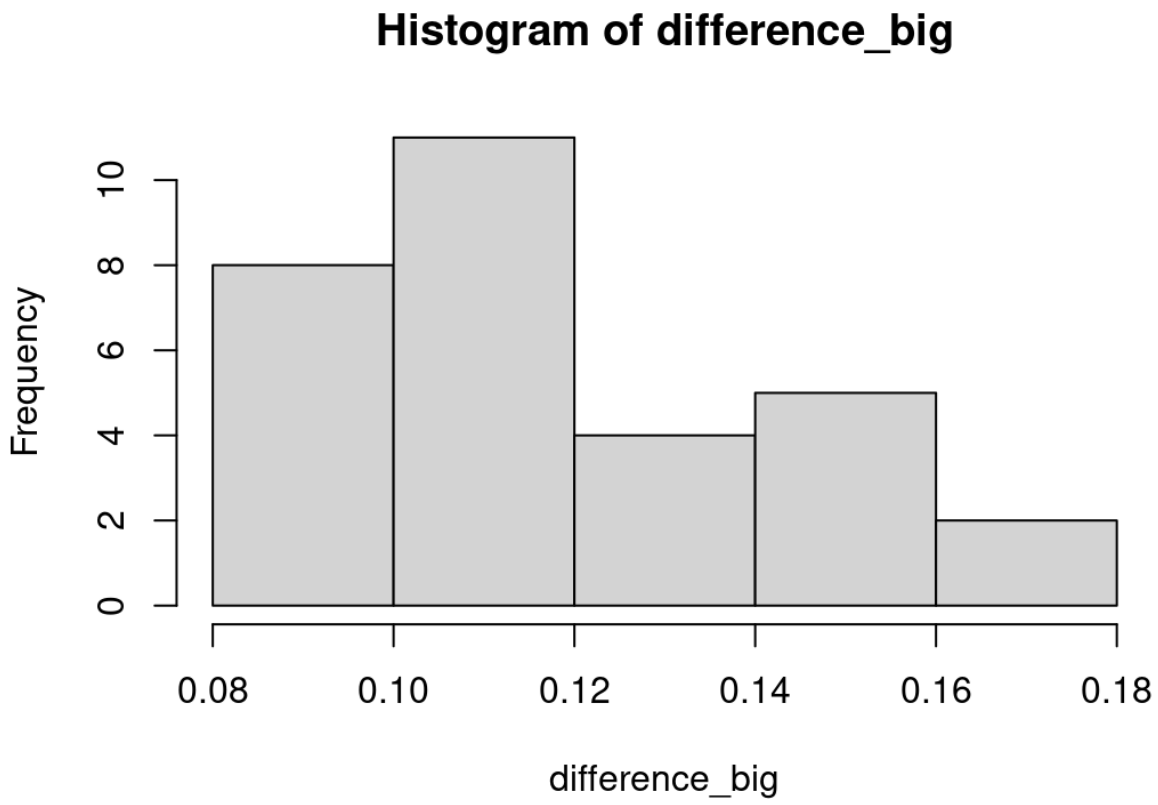
```
> plot(x=perimeter_crofton, y=perimeter_usual)
```

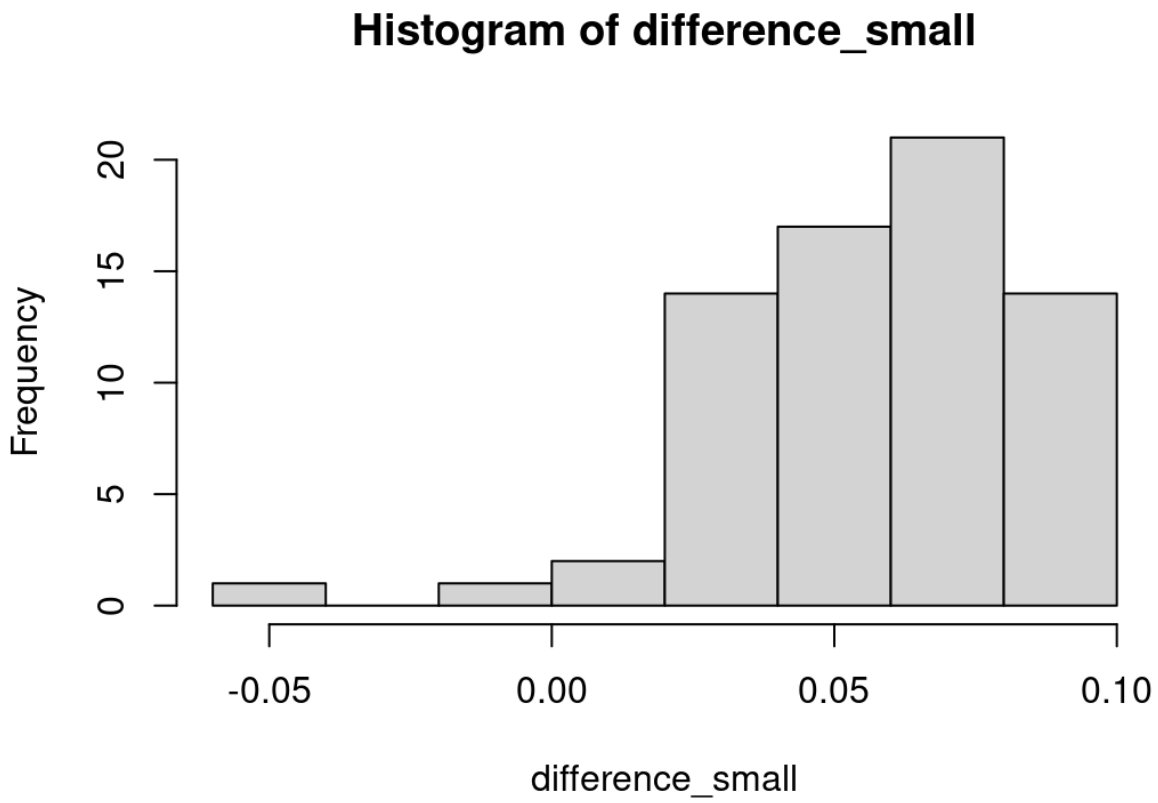


Porovnání měření na skupině malých mitochondrií a velkých mitochondrií

```
> big_usual = split(perimeter_usual, perimeter_usual>2)
> small_usual = big_usual[["FALSE"]]
> big_usual = big_usual[["TRUE"]]

> big_crofton = split(perimeter_crofton, perimeter_usual>2)
> small_crofton = big_crofton[["FALSE"]]
> big_crofton = big_crofton[["TRUE"]]
> hist(big_crofton)
> plot(x=small_crofton, y=small_usual)
```


Histogram of difference_big
Frequency
0
2
4
6
8
10
0.08
0.10
0.12
0.14
0.16
0.18
difference_big


Histogram of difference_small
Frequency
0
5
10
15
20
-0.05
0.00
0.05
0.10
difference_small