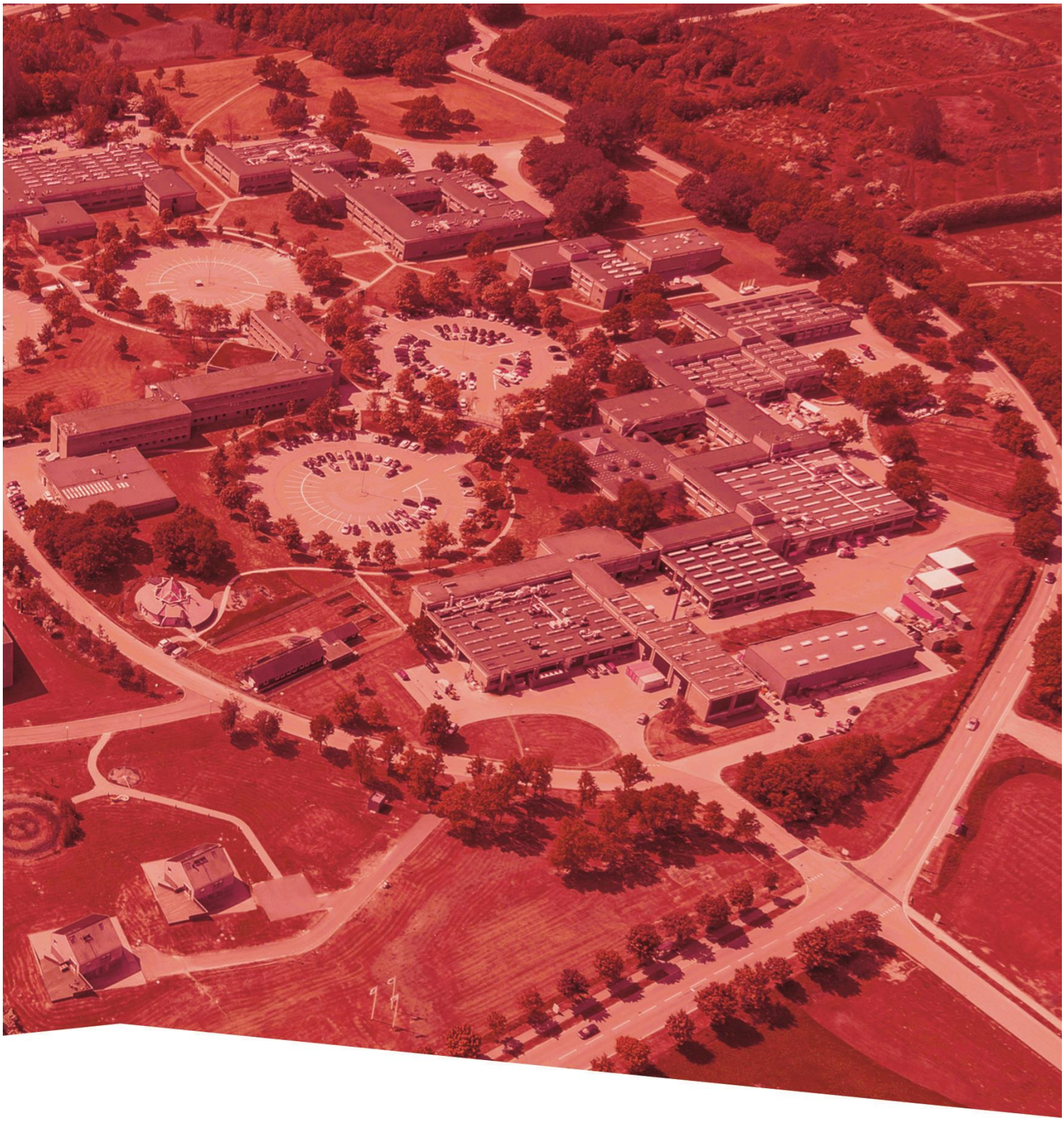

DANISH
TECHNOLOGICAL
INSTITUTE

DANISH
TECHNOLOGICAL
INSTITUTE

Statistical analysis of the data from Naturally excited water project

Prepared by
Neda Nasiri Moghadam
Danish Technological Institute
Kongsvang Allé 29
DK-8000 Aarhus C
Denmark
Water and Biotechnology

November 2022

Comments by NEW-Water on the Conclusion by the Danish Technological Institute

Zone D max value is an expression of the maximum amount of work (wats) that the participant was able to deliver during the VO2Max test. Zone D work rate has significantly increased by 3,3% in the group that drank New Water between day 0 to day 3. And the group B that drank reverse osmosis water the max work rate decreased. This is statistically calculated to be significant, which means it is scientifically proven.

This means that if you drink NEW water your performance improves so you can deliver more work during exercise than before drinking NEW water.

Furthermore, the participants that drank NEW water has significantly increased in their Zone A work rate which is the fat burning zone. This indicates that the body has been optimized since it now can produce more energy in the most efficient way, which is to burn fat aerobic.

Please continue to read the report in its entirety, the rest of the report is written entirely by the Danish Technological Institute.

Kind regards

New-water.com

Jesper Bendsen

Conclusion

In general, across all zones (A, B, C and D) the HR (Heart Rate) and WR (Work Rate) of group A (received treated reverse osmosis water) were higher at Time 2 compared Time 1, however in group B (received normal reverse osmosis water), the individuals showed a lower HR and WR at Time 2 compared to Time 1. According to the statistical analysis, this difference was significant only in the Zone D where the group A individuals showed 1.6 % higher HR ($p = 0.05$) and 3.3% higher WR ($p = 0.04$) at Time 2 compared to Time 1. In a comparison between the group A and B within each time point, the WR of the group A was significantly higher than the group B at Time 2 ($p = 0.002$), while no significant difference was observed between these groups at Time 1 ($p = 0.08$).

Method

In the present assignment DTI solely performed statistical analysis of data provided by the customer.

According to the customer, the influence of a treated reverse osmosis water (water A[1]) and a normal reverse osmosis water (water B) was assessed on the oxygen absorbance (VO2Max) of 24 individuals (males from 11 to 72 years old) during a cycling test: Individuals were randomly assigned to two groups (12 individuals per group). The average age of individuals in the groups A and B was 44- and 36-year-old, respectively. In both groups, the VO2Max of individuals were assessed before (Time 1) and after (Time 2) drinking the test waters A or B. After Time 1 assessment, the individuals drank one of the test waters (A or B) for three days (ca. 3 liters per day) and their VO2Max was checked exactly 72 hours after the Time 1. The following information were collected using a standard equipment (Kettler Racer cykelergometer, cortex Metalyzer 3b-r3 iltoptagelsesudstyr) during the cycling test in both time points:

- Heart rate
- Breathing volume
- Breathing rate
- Breathing capacity (O_2 consumption and CO_2 production)

Then using the Metasoft software, the fat and carb burning phases, slightly anaerobic and excessive anaerobic phases, WR and VO2Max were calculated. These tests were executed by Max Boderskov from the LØBESHOP company (www.loebeshop.dk). The test results were sent to the Danish Technological institute by Max Boderskov for statistical analysis. The following information was requested by the costumer to be extracted from the test files:

- Zone A: Fat burning phase (HR and WR)
- Zone B: Carb burning phase (HR and WR)
- Zone C: Slightly anaerobic phase (HR and WR)
- Zone D: Excessive anaerobic phase and VO2Max (HR and WR)

Except the Zone A, which contained only a maximum number, the data in other Zones had a minimum and a maximum number. The maximum number of each Zone was collected and used for the analysis based on the costumer's request. The study was triple-blind. Before the study the group assignment was written down in an encrypted file and was sent to the participants in the project at the end of the study. Therefore, the individuals, the VO2Max test conductor and the data analyst were not aware of the group assignment.

[1] Water A is provided by a patent pending invention that treats water energetically to optimize the energy level in water. www.NEW-water.com.

Data analysis

The normality of data and the presence of outliers were checked before analysis. Changes in the mean scores from Time 1 to Time 2 were analyzed with a repeated-measures ANOVA. Difference between group A and B within each time point was analyzed with a Two-Way ANOVA. All analysis were performed in the R statistical software (R core Team 2016).

Table 1. Statistical summary of data. The table shows the number of replicates (n), average (mean), standard deviation (sd), standard error (se) and median for each trait at Time 1 and Time 2 for the treatment groups A and B.

treatment	trait	time	variable	n	mean	sd	se	median
A	ZoneAHR	1	resp	12	127.167	15.782	4.556	130.5
A	ZoneAWR	1	resp	12	210.833	46.179	13.331	214.0
A	ZoneBHR	1	resp	12	138.500	17.191	4.963	139.5
A	ZoneBWR	1	resp	12	251.583	57.987	16.739	262.5
A	ZoneCHR	1	resp	12	161.333	14.748	4.257	160.0
A	ZoneCWR	1	resp	12	342.167	66.360	19.156	349.5
A	ZoneDHR	1	resp	12	168.417	12.638	3.648	171.0
A	ZoneDWR	1	resp	12	368.250	68.898	19.889	373.5
B	ZoneAHR	1	resp	12	130.583	18.012	5.200	128.0
B	ZoneAWR	1	resp	12	171.000	59.743	17.246	190.0
B	ZoneBHR	1	resp	12	144.667	16.328	4.714	140.0
B	ZoneBWR	1	resp	12	235.000	61.357	17.712	248.5
B	ZoneCHR	1	resp	12	167.333	18.092	5.223	165.5
B	ZoneCWR	1	resp	12	309.417	66.718	19.260	343.0
B	ZoneDHR	1	resp	12	174.917	16.423	4.741	173.0
B	ZoneDWR	1	resp	12	340.250	81.010	23.385	363.5
A	ZoneAHR	2	resp	12	132.333	17.717	5.114	132.5
A	ZoneAWR	2	resp	12	227.417	43.002	12.414	230.0
A	ZoneBHR	2	resp	12	142.417	14.081	4.065	145.0
A	ZoneBWR	2	resp	12	262.667	44.783	12.928	267.5
A	ZoneCHR	2	resp	12	162.583	14.841	4.284	164.5
A	ZoneCWR	2	resp	12	345.167	61.112	17.642	345.0
A	ZoneDHR	2	resp	12	171.167	13.422	3.875	176.0
A	ZoneDWR	2	resp	12	380.750	63.812	18.421	389.5
B	ZoneAHR	2	resp	12	127.500	17.186	4.961	125.5
B	ZoneAWR	2	resp	12	159.750	53.234	15.367	163.5
B	ZoneBHR	2	resp	12	143.000	20.158	5.819	142.0
B	ZoneBWR	2	resp	12	225.750	50.720	14.642	240.5
B	ZoneCHR	2	resp	12	166.417	16.003	4.620	168.0
B	ZoneCWR	2	resp	12	305.667	76.582	22.107	330.5
B	ZoneDHR	2	resp	12	173.583	16.312	4.709	173.5
B	ZoneDWR	2	resp	12	334.917	83.062	23.978	361.0

Results

The statistical summary of data is presented in

. The normality assumption was met for all factors except 3 cases that are presented in Table 2.

Table 2. Result of the normality assessment by Shapiro-Wilk's test ($p \leq 0.05$)

treatment	trait	time	variable	statistic	p
A	ZoneAHR	1	resp	0.9039045	0.178122113
B	ZoneAHR	1	resp	0.9580470	0.755628691
A	ZoneAWR	1	resp	0.9797714	0.982725736
B	ZoneAWR	1	resp	0.7700499	0.004363052
A	ZoneBHR	1	resp	0.9165621	0.258703444
B	ZoneBHR	1	resp	0.9027018	0.171875429
A	ZoneBWR	1	resp	0.9247279	0.327556044
B	ZoneBWR	1	resp	0.9710393	0.921381514
A	ZoneCHR	1	resp	0.9223174	0.305695295
B	ZoneCHR	1	resp	0.9527387	0.677302945
A	ZoneCWR	1	resp	0.8823229	0.093868313
B	ZoneCWR	1	resp	0.7662345	0.003969337
A	ZoneDHR	1	resp	0.9337502	0.421561607
B	ZoneDHR	1	resp	0.9511142	0.653327549
A	ZoneDWR	1	resp	0.9566706	0.735460263
B	ZoneDWR	1	resp	0.8789274	0.084918005
A	ZoneAHR	2	resp	0.9200301	0.286162121
B	ZoneAHR	2	resp	0.9657108	0.861116509
A	ZoneAWR	2	resp	0.8878066	0.110415069
B	ZoneAWR	2	resp	0.8571102	0.044985088
A	ZoneBHR	2	resp	0.8909360	0.121160596
B	ZoneBHR	2	resp	0.9802300	0.984547138
A	ZoneBWR	2	resp	0.9765960	0.966338261
B	ZoneBWR	2	resp	0.9144935	0.243506983
A	ZoneCHR	2	resp	0.8897317	0.116905199
B	ZoneCHR	2	resp	0.9438497	0.549489811
A	ZoneCWR	2	resp	0.9588043	0.766633007
B	ZoneCWR	2	resp	0.9018849	0.167755768
A	ZoneDHR	2	resp	0.8921872	0.125748092
B	ZoneDHR	2	resp	0.9348912	0.434845568
A	ZoneDWR	2	resp	0.9447890	0.562473417
B	ZoneDWR	2	resp	0.8797644	0.087039566

There were two extreme outliers among the data, which did not influence the results (the ANOVA results were similar with and without the outliers). In general, in all zones (A, B, C and D) the HR and WR of

individuals in group A was higher at Time 2 compared to Time 1, however the individuals in group B showed a lower HR and WR at Time 2 compared to Time 1 (Figure 1).

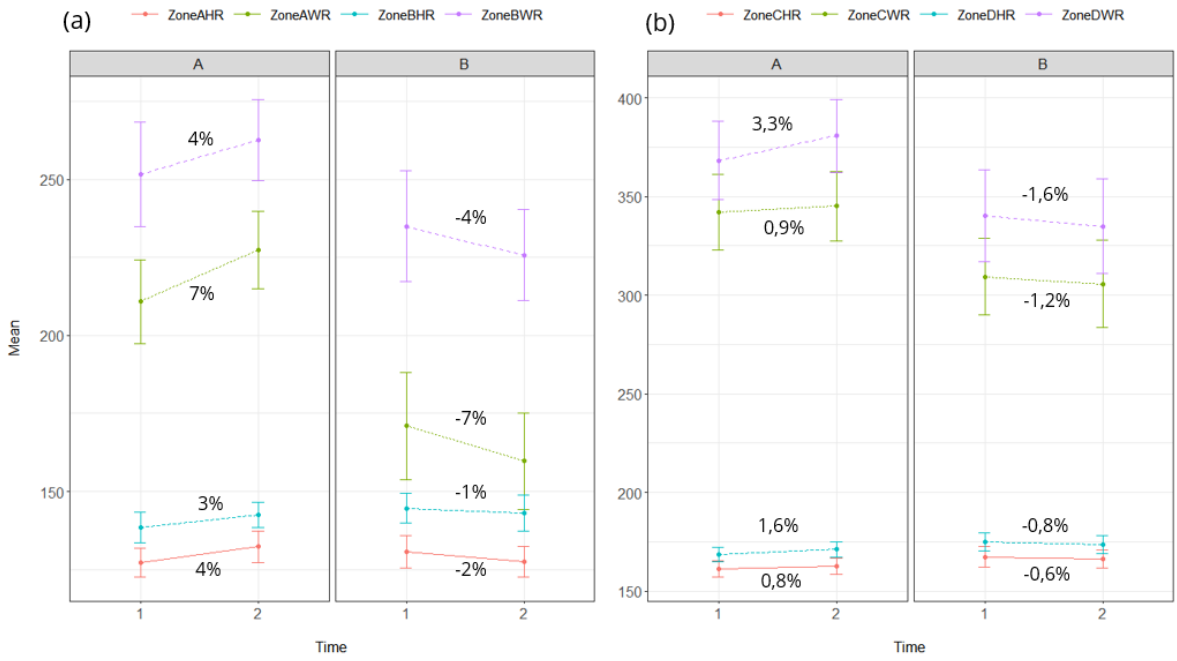

Figure 1. Mean scores in Time 1 and 2 for group A and B. The numbers show the percentage of change in the mean scores from Time 1 to Time 2. Graph (a) shows the Zone A and B scores, and graph (b) belongs to Zone C and D.

Based on the repeated-measures ANOVA, the higher HR and WR of the group A at Time 2 compared to Time 1 was significant only in the Zone D (HR 1.6%, p = 0.05; WR 3.3%, p = 0.04). The results of the repeated-measures ANOVA are presented in Table 3.

Table 3. Results of the repeated-measures ANOVA. Significant p. values (p ≤ 0.05) are shown in bold.

Treatment	Trait	df	p.value
A	Zone A HR	11	0,07
A	Zone A WR	11	0,12
A	Zone B HR	11	0,07
A	Zone B WR	11	0,22
A	Zone C HR	11	0,45
A	Zone C WR	11	0,71
A	Zone D HR	11	**0,05**
A	Zone D WR	11	**0,04**
B	Zone A HR	11	0,27
B	Zone A WR	11	0,10
B	Zone B HR	11	0,61
B	Zone B WR	11	0,25
B	Zone C HR	11	0,71
B	Zone C WR	11	0,59
B	Zone D HR	11	0,29
B	Zone D WR	11	0,16

In a comparison between group A and B within each time point we observed that the WR of the group A was significantly higher than the group B at Time 2 (p = 0.002), while no difference was observed between these groups at Time 1 (p = 0.08, Figure 2). The results of the Two-Way ANOVA are presented in the Table 4.

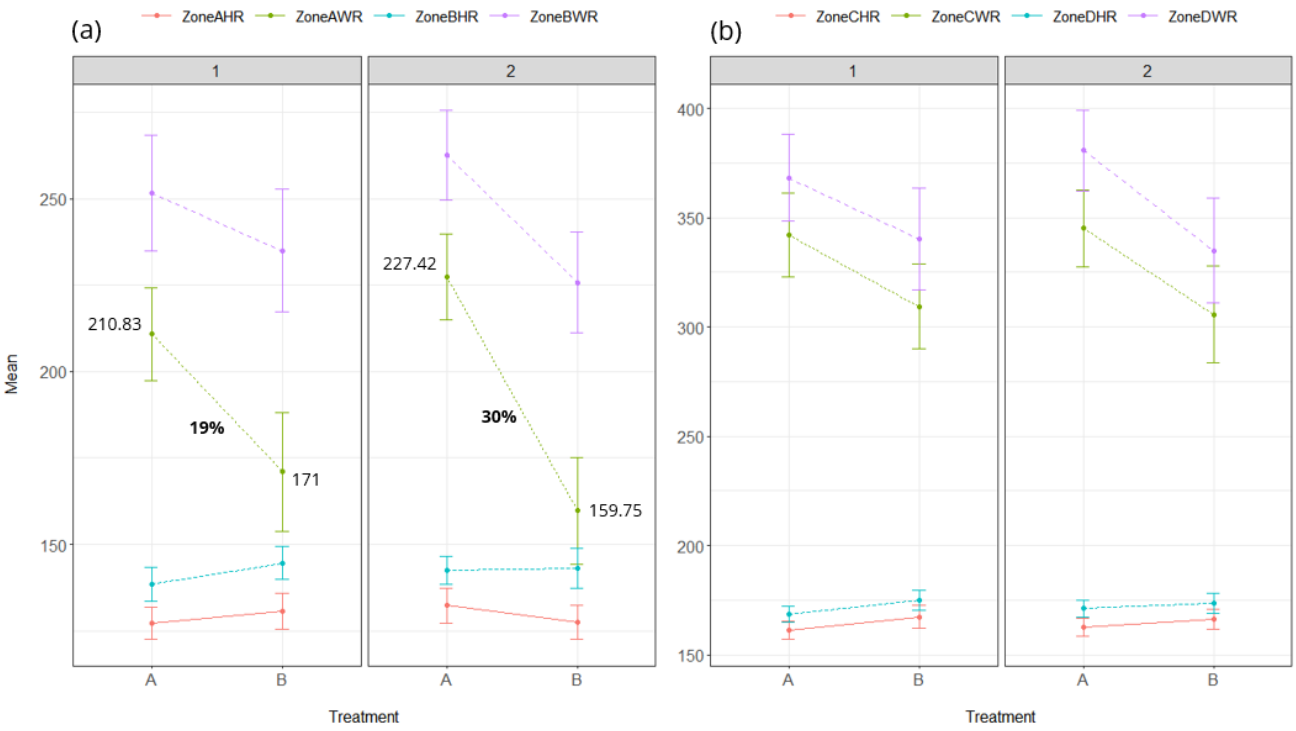

Figure 2. Mean scores of the group A and B within each time point. The numbers show the mean of WR in Zone A. Graph (a) belongs to the Zone A and B and graph (b) belongs to the Zone C and D.

Table 4. Comparison between group A and B within each time point (two-way ANOVA). Significant value (p ≤ 0.05) is presented in bold

Time	Trait	F value	Pr (>F)
1	Zone A HR	0,24	0,63
2	Zone A HR	0,46	0,51
1	Zone A WR	3,34	0,08
2	Zone A WR	11,73	**0,002**
1	Zone B HR	0,81	0,38
2	Zone B HR	0,01	0,94
1	Zone B WR	0,46	0,50
2	Zone B WR	3,57	0,07
1	Zone C HR	0,79	0,38
2	Zone C HR	0,37	0,55
1	Zone C WR	1,45	0,24
2	Zone C WR	1,95	0,18
1	Zone D HR	1,18	0,29
2	Zone D WR	2,30	0,14
1	Zone D WR	0,83	0,37
2	Zone D HR	0,16	0,70

DANISH
TECHNOLOGICAL
INSTITUTE