Analysis Report

This report is structured as follows.

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Descriptive Statistics

From the descriptive statistics, we observe that the means for the post-wash measurements with CleanTrax and 2% iodine tincture show a general trend of reduction compared to the pre-wash measurements. For example, in the case of wall_1_100000, the mean reduction is significant, dropping from 48.9 (pre-wash) to 0.2 and 0.6 for CleanTrax and 2% iodine tincture, respectively. Similarly, for sole_1_10000_dilution, the mean decreases from 74.0 to 5.0 (CleanTrax) and 4.7 (2% iodine tincture), indicating a substantial reduction post-wash. The standard deviations (SD) give an idea of the variability in these measurements, with some variables showing a wider spread of data than others.

Variable	Pre Wash		Post Wash CleanTrax		Post Wash 2%_iodine_Tincture	
	Mean	SD	Mean	SD	Mean	SD
wall_1_10_dilution	N/A	N/A	16.400	5.103	17.800	7.642
wall_1_1000_dilution	N/A	N/A	4.800	1.989	6.400	2.914
wall_1_100000	48.900	11.396	0.200	0.422	0.600	0.843
sole_1_1000_dilution	N/A	N/A	27.200	7.613	23.900	7.923
sole_1_10000_dilution	74.000	12.083	5.000	2.000	4.700	2.669
frog_1_1000_dilution	N/A	N/A	38.700	11.451	38.100	10.126
frog_1_10000_dilution	81.000	10.975	5.600	2.547	5.400	2.716

The contamination reduced by 99.6% when using CleanTrax on Wall compared to a 98.77% reduction when using 2% iodine tincture. On the Sole, the figures were pretty similar (93.2% and 93.6%). Similar reductions were also found for the Frog (93.09% and 93.3%).

The prewash contamination levels were statistically different between Wall and Sole ($w = 5.5$, $p < 0.001$) and between Wall and Frog ($w = 0$, $p < 0.001$). Levels of contamination were similar between Sole and Frog ($p > 0.05$).

Comparison	Mean1	Mean2	W_Statistic	P_Value
wall_1_100000 vs sole_1_10000_dilution	48.9	74	5.5	0.001
wall_1_100000 vs frog_1_10000_dilution	48.9	81	0	0.000
sole_1_10000_dilution vs frog_1_10000_dilution	74	81	34	0.241

Wilcoxon Signed-Rank Test

The Wilcoxon Signed-Rank Test is used to compare the median differences between two related samples or matched pairs. This non-parametric test is particularly useful when the data do not follow a normal distribution, which is often the case in biological or medical studies. It assesses whether the

median of the differences between pairs of observations is zero, which in this context translates to no significant change in the measurements post-wash compared to pre-wash.

Measurement	Mean_2%_iodine_Tincture	Mean_CleanTrax	W_Statistic	P_Value
wall_1_10_dilution	17.8	16.4	27	0.635
wall_1_1000_dilution	6.4	4.8	35.5	0.137
wall_1_100000	0.6	0.2	16	0.279
sole_1_1000_dilution	23.9	27.2	20.5	0.507
sole_1_10000_dilution	4.7	5	21	0.905
frog_1_1000_dilution	38.1	38.7	25	0.838
frog_1_10000_dilution	5.4	5.6	23	0.680

For measurements such as wall_1_10_dilution, wall_1_1000_dilution, and sole_1_1000_dilution, the P_values are greater than 0.05, suggesting that the changes in these variables post-wash are not statistically significant for either treatment.

The W_Statistic provides the rank sum of the differences between paired observations. A higher value indicates more significant differences between pairs. However, in this analysis, none of the variables showed a statistically significant change, as reflected in the P_values. Wall_1_1000_dilution was a measure that approached statistical significance with $p = 0.137$, showing a trend that the reduction ofor CleanTrax was higher compared to 2% iodine tincture.

In summary, while the descriptive statistics suggest reductions in measurements post-wash with both CleanTrax and 2% iodine tincture, the Wilcoxon Signed-Rank Test indicates that these reductions are not significantly different between the two products. This discrepancy highlights the importance of considering both the mean (and its variability) and the median (through non-parametric tests) in understanding the data. The lack of significant findings in the Wilcoxon test might be due to various factors, including sample size, variability in the data, or the actual effectiveness of the treatments.