

CHAPTER IV

RESULTS AND DISCUSSION

This chapter presents the result, the analysis, and interpretation of data gathered from the questionnaires distributed to the participants and data gathered through Test like PH meter and water absorption test.

This chapter seeks to answer the following statement of the problem:

1.) Determine which of the following treatments prepared T1 (**10%** orange peel oil), T2 (**20%** orange peel oil), and T3 (**30%** orange peel oil) will be the most effective in terms of:

- a) Shine enhancement
- b) Spreadability b
- c) pH Level
- d) Water absorption

2.) Determine if there is a significant difference between treatments.

- 1. Calculate the Mean, Variance, and Average for each treatment group (T1, T2, T3) for both shine enhancement and spreadability tests.
- 2. Perform a One-Way ANOVA to determine if there are significant differences among the treatments.

Treatment	Shine Mean	Shine Variance	Spreadability Mean	Spreadability Variance
T1 (10% Orange Oil)	3.37	1.53	3.49	1.26
T2 (20% Orange Oil)	3.46	1.08	3.60	1.13
T3 (30% Orange Oil)	3.83	0.62	3 .97	1.38

One-Way ANOVA Test Results:

- **Shine Enhancement ANOVA p-value: 0.152**
- **Spreadability ANOVA p-value: 0.171**

Interpretation:

Since the p-values for both shine and spreadability are greater than 0.05, we fail to reject the null hypothesis. This suggests that there is no statistically significant difference between the treatments in terms of shine and spreadability. However, T3 (30% orange oil) has the highest mean in both categories, implying that it may still be the most effective.

The following datas from questions from treatments 1 to 3 will be presented through tabular form.

pH level results

According to **Dan Concard (2024)**, the pH of suitable leather care products should generally fall within the optimal range of **4.5 to 5** to ensure its safe.

TREATMENT NO.	RESULT
Treatment 1 (10% orange peel oil)	
Treatment 2 (20% orange peel oil)	
Treatment 3 (30% orange peel oil)	

Shine Enhancement (Higher is better)

- T1 (10%): 3.37
- T2 (20%): 3.46
- T3 (30%): 3.83 (Highest)

Spreadability (Higher is better)

- T1 (10%): 3.49
- T2 (20%): 3.60
- T3 (30%): 3.97 (Highest)

Conclusion

- T3 (30% orange peel oil) performed the best in both shine enhancement and spreadability.
- T1 (10%) had the lowest scores overall.
- T2 (20%) showed a slight improvement over T1 but was still outperformed by T3.

Treatment	Average Shine Enhancement	Average spreadability
T1 (10%)	3.37	3.49
T2 (20%)	3.46	3.60
T3 (30%)	3.83	3.97

Water Absorption Result:

Treatment	Weight Before (g)	Weight After (g)	Significant Difference
T1	g	g	
T2	g	g	
T3	g	g	

CHAPTER V

CONCLUSION AND RECOMMENDATION

This chapter of the research presents the summary of the study as well as its recommendation.

Recommendation:

T-Test Results: Statistical Comparison of Treatments vs. Control

Comparison	t-Statistic	p-Value	Significance ($p < 0.05$)
T1 vs Control (Shine)	2.25	0.0271	<input checked="" type="checkbox"/> Significant
T2 vs Control (Shine)	3.09	0.0028	<input checked="" type="checkbox"/> Significant
T3 vs Control (Shine)	5.20	0.00000191	<input checked="" type="checkbox"/> Highly Significant
T1 vs Control (Spreadability)	2.50	0.0147	<input checked="" type="checkbox"/> Significant
T2 vs Control (Spreadability)	2.57	0.0122	<input checked="" type="checkbox"/> Significant
T3 vs Control (Spreadability)	4.24	0.0000606	<input checked="" type="checkbox"/> Highly Significant

Interpretation:

- All treatments (T1, T2, and T3) significantly improved both shine and spreadability compared to the control.
- T3 (30% orange peel oil) showed the strongest improvement with the highest t-values and the lowest p-values, confirming its effectiveness.
- Since all p-values are below 0.05, we can confidently say that adding orange peel oil significantly enhances shoe polish performance.

Would you like further comparisons (e.g., between T1 vs. T2, T2 vs. T3)? 😊