

## APPENDICES

## Appendix A

Faculty of Science and Technology

UNIVERSITI SAINS ISLAM MALAYSIA

Analytical Descriptive and affective Test

Age:.....

Date:.....

Hometown:.....

You are given four samples of bread coded A, B, C and D. Compare the attributes of these samples in terms of colour, aroma, hardness, taste and dryness.

## 1. Quantitative Descriptive Analysis

Using a scale of 0-10 as below, put down your intensity score for the mentioned attributes for the four samples in the columns below:

0.....10

None

Highest

QDA Test scores				
Attributes				
Colour				
Hardness				
Taste				
Dryness				
Aroma				
Appearance				

## 2. Hedonic Test

Using a scale of 1-7 as below, indicate your preference (overall acceptability).

7 = Like extremely.

6 = Like moderately.

5 = Like slightly.

4 = neither like nor dislike.

3 = Dislike slightly.

2 = dislike moderately.

1 = Dislike extremely.

## Appendix B

## One-way ANOVA

## Gluten Results

02-Jul-14 9:17:07 PM

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## Descriptive Statistics: a1, b1, c1, d1

Variable	Mean	SE Mean	StDev	Minimum	Maximum
a1	17.867	0.117	0.202	17.650	18.050
b1	15.583	0.188	0.325	15.250	15.900
c1	18.883	0.348	0.603	18.250	19.450
d1	11.583	0.120	0.208	11.350	11.750

## One-way ANOVA: a1, b1, c1, d1

Source	DF	SS	MS	F	P
Factor	3	94.431	31.477	227.54	0.000
Error	8	1.107	0.138		
Total	11	95.537			

S = 0.3719 R-Sq = 98.84% R-Sq(adj) = 98.41%

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev	Lower CI	Upper CI
a	3	17.867	0.202	(*)	(*-)
b	3	15.583	0.325	(-*)	(*-)
c	3	18.883	0.603	(-*)	(-*)
d	3	11.583	0.208	(*-)	(*-)

Pooled StDev = 0.3719

Grouping Information Using Tukey Method

	N	Mean	Grouping
c1	3	18.8833	A
a1	3	17.8667	B
b1	3	15.5833	C
d1	3	11.5833	D

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Colour Results – a\*: A, B, C, D

16-Jul-14 7:01:02 PM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev	Minimum	Maximum
A	10.213	0.376	0.651	9.660	10.930
B	9.957	0.593	1.028	8.770	10.570
C	11.810	0.312	0.541	11.360	12.410
D	9.547	0.260	0.451	9.050	9.930

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	8.839	2.946	5.97	0.019
Error	8	3.951	0.494		
Total	11	12.790			

S = 0.7028 R-Sq = 69.11% R-Sq(adj) = 57.52%

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev	Lower CI	Upper CI
A	3	10.213	0.651	(---*---)	(---*---)
B	3	9.957	1.028	(---*---)	(---*---)
C	3	11.810	0.541	(---*---)	(---*---)
D	3	9.547	0.451	(---*---)	(---*---)

Pooled StDev = 0.7028

Grouping Information Using Tukey Method

	N	Mean	Grouping
C	3	11.8100	A
A	3	10.2133	A B
B	3	9.9567	B
D	3	9.5467	B

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Colour Results – b\*: A, B, C, D

16-Jul-14 7:10:36 PM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev	Minimum	Maximum
A	24.840	0.199	0.344	24.580	25.230
B	24.697	0.372	0.644	23.990	25.250
C	27.220	0.271	0.469	26.910	27.760
D	24.507	0.143	0.248	24.230	24.710

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	14.671	4.890	24.01	0.000
Error	8	1.630	0.204		
Total	11	16.301			

S = 0.4513 R-Sq = 90.00% R-Sq(adj) = 86.25%

Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev
A	3	24.840	0.344	(---*---)
B	3	24.697	0.644	(---*---)
C	3	27.220	0.469	(---*---)
D	3	24.507	0.248	(---*---)

Pooled StDev = 0.451

## Grouping Information Using Tukey Method

	N	Mean	Grouping
C	3	27.2200	A
A	3	24.8400	B
B	3	24.6967	B
D	3	24.5067	B

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Colour results L \* - A, B, C, D

16-Jul-14 6:49:54 PM

Welcome to Minitab, press F1 for help.

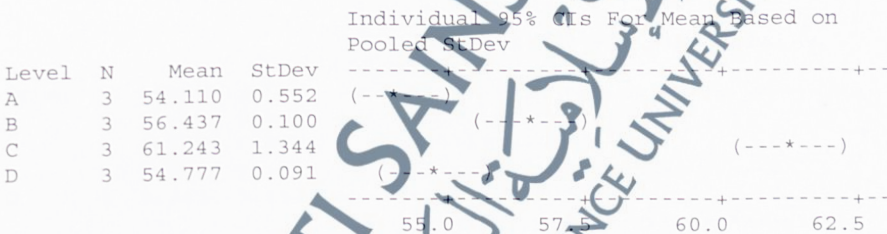
## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev	Minimum	Maximum
A	54.110	0.319	0.552	53.710	54.740
B	56.437	0.0578	0.100	56.360	56.550
C	61.243	0.776	1.344	60.290	62.780
D	54.777	0.0524	0.0907	54.710	54.880

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	93.315	31.105	58.46	0.000
Error	8	4.257	0.532		
Total	11	97.572			

S = 0.7295 R-Sq = 95.64% R-Sq(adj) = 94.00%



Pooled StDev = 0.729

## Grouping Information Using Tukey Method

	N	Mean	Grouping
C	3	61.2433	A
B	3	56.4367	B
D	3	54.7767	B C
A	3	54.1100	C

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Crust Colour Result – “a “: A, B, C, D

16-Jul-14 7:31:12 PM

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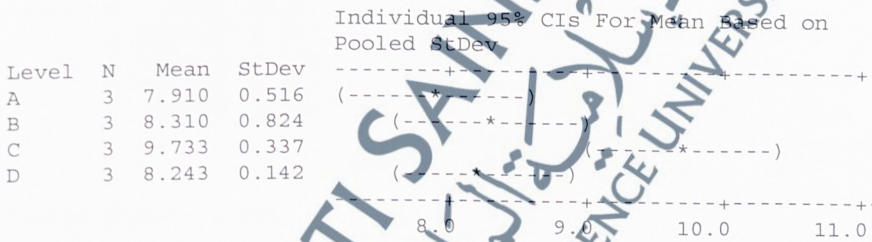
## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev	Minimum	Maximum
A	7.910	0.298	0.516	7.330	8.320
B	8.310	0.476	0.824	7.370	8.910
C	9.733	0.195	0.337	9.460	10.110
D	8.2433	0.0817	0.1415	8.0800	8.3300

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	5.885	1.962	7.27	0.011
Error	8	2.160	0.270		
Total	11	8.044			

S = 0.5196 R-Sq = 73.15% R-Sq(adj) = 63.08%



Pooled StDev = 0.520

## Grouping Information Using Tukey Method

	N	Mean	Grouping
C	3	9.7333	A
B	3	8.3100	B
D	3	8.2433	B
A	3	7.9100	B

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Crust Colour Results – “b”:

16-Jul-14 8:00:21 PM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev	Minimum	Maximum
A	15.773	0.165	0.285	15.490	16.060
B	15.837	0.564	0.977	15.050	16.930
C	15.813	0.258	0.446	15.310	16.160
D	16.440	0.206	0.358	16.060	16.770

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	0.905	0.302	0.89	0.488
Error	8	2.725	0.341		
Total	11	3.630			

S = 0.5836 R-Sq = 24.94% R-Sq(adj) = 0.00%

Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev
A	3	15.773	0.285	(-----*-----)
B	3	15.837	0.977	(-----*-----)
C	3	15.813	0.446	(-----*-----)
D	3	16.440	0.358	(-----*-----)

15.00 15.60 16.20 16.80

Pooled StDev = 0.584

Grouping Information Using Tukey Method

	N	Mean	Grouping
D	3	16.4400	A
B	3	15.8367	A
C	3	15.8133	A
A	3	15.7733	A

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Crust Colour Results – "L":

16-Jul-14 7:19:39 PM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev	Minimum	Maximum
A	47.007	0.341	0.590	46.580	47.680
B	49.337	0.0649	0.112	49.240	49.460
C	54.300	0.849	1.470	53.200	55.970
D	46.673	0.0521	0.0902	46.580	46.760

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	111.470	37.157	58.73	0.000
Error	8	5.062	0.633		
Total	11	116.532			

S = 0.7954 R-Sq = 95.66% R-Sq(adj) = 94.03%

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev	-----+-----
A	3	47.007	0.590	(---*---)
B	3	49.337	0.112	(---*---)
C	3	54.300	1.470	(---*---)
D	3	46.673	0.090	(---*---)

47.5      50.0      52.5      55.0

Pooled StDev = 0.795

## Grouping Information Using Tukey Method

	N	Mean	Grouping
C	3	54.300	A
B	3	49.337	B
A	3	47.007	C
D	3	46.673	C

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Weight Result

17-Oct-14 12:20:34 PM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	819.70	1.47	2.55
B	811.17	0.601	1.04
C	806.00	2.10	3.63
D	810.77	0.491	0.850

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	292.42	97.47	18.10	0.001
Error	8	43.07	5.38		
Total	11	335.49			

S = 2.320 R-Sq = 87.16% R-Sq(adj) = 82.35%

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev
A	3	819.70	2.55
B	3	811.17	1.04
C	3	806.00	3.63
D	3	810.77	0.85

805.0 810.0 815.0 820.0

Pooled StDev = 2.32

### Grouping Information Using Tukey Method

	N	Mean	Grouping
A	3	819.700	A
B	3	811.167	B
D	3	810.767	E
C	3	806.000	B

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Height Result

17-Oct-14 12:27:10 PM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	11.633	0.203	0.351
B	9.967	0.318	0.551
C	13.433	0.470	0.814
D	9.833	0.167	0.289

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	25.690	8.563	29.19	0.000
Error	8	2.347	0.293		
Total	11	28.037			

S = 0.5416 R-Sq = 91.63% R-Sq(adj) = 88.49%

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev	Lower CI	Upper CI
A	3	11.633	0.351	(---*---)	(---*---)
B	3	9.967	0.551	(---*---)	(---*---)
C	3	13.433	0.814	(---*---)	(---*---)
D	3	9.833	0.289	(---*---)	(---*---)

10.5      12.0      13.5      15.0

Pooled StDev = 0.542

## Grouping Information Using Tukey Method

	N	Mean	Grouping
C	3	13.4333	A
A	3	11.6333	B
B	3	9.9667	C
D	3	9.8333	C

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Weight/height Result

17-Oct-14 12:37:00 PM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	70.50	1.10	1.90
B	81.56	2.66	4.60
C	60.16	2.33	4.03
D	82.50	1.37	2.38

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	997.9	332.6	28.49	0.000
Error	8	93.4	11.7		
Total	11	1091.3			

S = 3.417 R-Sq = 91.44% R-Sq(adj) = 88.23%

Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev
A	3	70.500	1.904	(-----*-----)
B	3	81.557	4.603	(-----*-----)
C	3	60.163	4.030	(-----*-----)
D	3	82.497	2.377	(-----*-----)

56.0      64.0      72.0      80.0

Pooled StDev = 3.417

Grouping Information Using Tukey Method

	N	Mean	Grouping
D	3	82.497	A
B	3	81.557	A
A	3	70.500	B
C	3	60.163	C

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Texture Result:

16-Jul-14 9:26:46 PM

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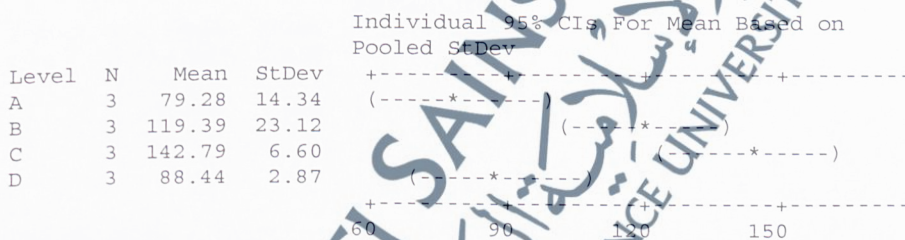
## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev	Minimum	Maximum
A	79.28	8.28	14.34	70.56	95.83
B	119.4	13.4	23.1	93.2	137.0
C	142.79	3.81	6.60	135.18	146.91
D	88.44	1.66	2.87	85.15	90.40

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	7640	2547	12.86	0.002
Error	8	1584	198		
Total	11	9224			

S = 14.07    R-Sq = 82.82%    R-Sq(adj) = 76.38%



Pooled StDev = 14.07

## Grouping Information Using Tukey Method

	N	Mean	Grouping
C	3	142.79	A
B	3	119.39	A B
D	3	88.44	B C
A	3	79.28	C

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Moisture Result

09-Oct-14 1:21:17 PM

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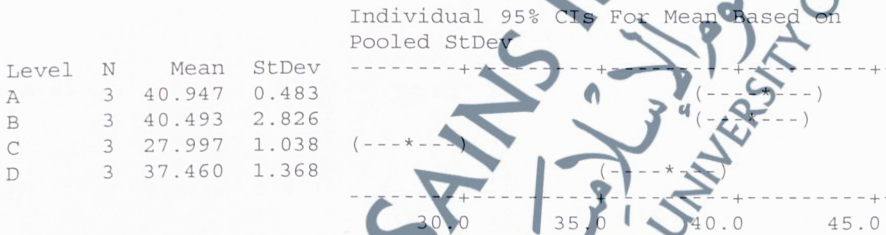
## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	40.947	0.279	0.483
B	40.49	1.63	2.83
C	27.997	0.599	1.038
D	37.460	0.790	1.368

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	326.24	108.75	38.94	0.000
Error	8	22.34	2.79		
Total	11	348.58			

S = 1.671 R-Sq = 93.59% R-Sq(adj) = 91.19%



Pooled StDev = 1.671

## Grouping Information Using Tukey Method

	N	Mean	Grouping
A	3	40.947	A
B	3	40.493	A
D	3	37.460	A
C	3	27.997	B

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Ash results

16-Jul-14 5:29:46 PM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev	Minimum	Maximum
A	0.9871	0.0507	0.0879	0.9230	1.0873
B	1.0221	0.0214	0.0371	0.9860	1.0602
C	0.9908	0.0167	0.0289	0.9580	1.0123
D	0.6706	0.0419	0.0726	0.6044	0.7482

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	0.24638	0.08213	21.60	0.000
Error	8	0.03041	0.00380		
Total	11	0.27680			

S = 0.06166 R-Sq = 89.01% R-Sq(adj) = 84.89%

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev	CI Lower	CI Upper
A	3	0.9871	0.0879	0.8000	1.1742
B	3	1.0221	0.0371	0.9478	1.0964
C	3	0.9908	0.0289	0.9330	1.0486
D	3	0.6706	0.0726	0.5254	0.8158

Pooled StDev = 0.0617

Grouping Information Using Tukey Method

	N	Mean	Grouping
B	3	1.02207	A
C	3	0.99080	A
A	3	0.98710	A
D	3	0.67057	B

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Protein Result

09-Oct-14 12:52:25 PM

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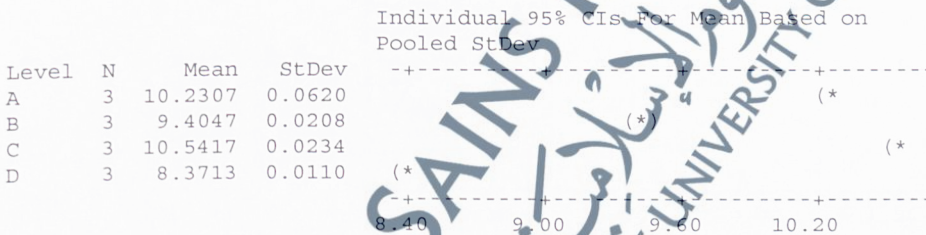
### Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	10.231	0.0358	0.0620
B	9.4047	0.0120	0.0208
C	10.542	0.0135	0.0234
D	8.3713	0.00636	0.0110

### One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	8.48026	2.82675	2285.01	0.000
Error	8	0.00990	0.00124		
Total	11	8.49015			

S = 0.03517    R-Sq = 99.88%    R-Sq(adj) = 99.84%



Pooled StDev = 0.0352

Grouping Information Using Tukey Method

	N	Mean	Grouping
C	3	10.5417	A
A	3	10.2307	B
B	3	9.4047	C
D	3	8.3713	D

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Fiber Result

25-Sep-14 1:08:06 PM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	0.0820	0.0211	0.0366
B	0.1446	0.0194	0.0337
C	1.0655	0.0217	0.0375
D	1.0271	0.00998	0.0173

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	2.61957	0.87319	834.93	0.000
Error	8	0.00837	0.00105		
Total	11	2.62793			

S = 0.03234 R-Sq = 99.68% R-Sq(adj) = 99.56%

Individual 95% CIs for Mean Based on Pooled StDev

Level	N	Mean	StDev	CI Lower	CI Upper
A	3	0.0820	0.0366	(-*)	(-*)
B	3	0.1446	0.0337	(-*)	(-*)
C	3	1.0655	0.0375	(-*)	(-*)
D	3	1.0271	0.0173	(*)	(*)

0.30 0.60 0.90 1.20

Pooled StDev = 0.0323

## Grouping Information Using Tukey Method

	N	Mean	Grouping
C	3	1.0655	A
D	3	1.0271	A
B	3	0.1446	B
A	3	0.0820	B

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Carbohydrate Result

26-Sep-14 3:16:37 PM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	43.410	0.220	0.380
B	46.94	1.80	3.12
C	56.662	0.658	1.140
D	51.27	1.01	1.74

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	294.19	98.06	27.57	0.000
Error	8	28.46	3.56		
Total	11	322.65			

S = 1.886 R-Sq = 91.18% R-Sq(adj) = 87.87%

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev
A	3	43.410	0.380
B	3	46.935	3.122
C	3	56.662	1.140
D	3	51.268	1.743

45.0 50.0 55.0 60.0

Pooled StDev = 1.886

## Grouping Information Using Tukey Method

	N	Mean	Grouping
C	3	56.662	A
D	3	51.268	B
B	3	46.935	B C
A	3	43.410	C

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Energy Result

26-Sep-14 3:02:42 PM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	252.49	2.16	3.73
B	243.36	5.82	10.08
C	292.59	1.90	3.30
D	249.39	2.71	4.69

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	4520.2	1506.7	40.60	0.000
Error	8	296.9	37.1		
Total	11	4817.1			

S = 6.092 R-Sq = 93.84% R-Sq(adj) = 91.53%

Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev
A	3	252.49	3.73	(---*---)
B	3	243.36	10.08	(---*---)
C	3	292.59	3.30	(---*---)
D	3	249.39	4.69	(---*---)

240      260      280      300

Pooled StDev = 6.09

## Grouping Information Using Tukey Method

	N	Mean	Grouping
C	3	292.588	A
A	3	252.489	B
D	3	249.386	B
B	3	243.360	B

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.74%

## Quantative Descriptive Analysis: COLOUR Attribute

26-Sep-14 10:23:56 AM

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### Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	4.500	0.142	1.097
B	6.733	0.116	0.899
C	5.967	0.123	0.956
D	6.783	0.121	0.940

### One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	204.146	68.049	71.42	0.000
Error	236	224.850	0.953		
Total	239	428.996			

S = 0.9761 R-Sq = 47.59% R-Sq(adj) = 46.92%

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev	Lower CI	Upper CI
A	60	4.5000	1.0970	2.3000	6.7000
B	60	6.7333	0.8995	5.8338	7.6328
C	60	5.9667	0.9561	5.0106	6.9228
D	60	6.7833	0.9405	5.8428	7.7238

4.90 5.60 6.30 7.00

Pooled StDev = 0.9761

Grouping Information Using Tukey Method

	N	Mean	Grouping
D	60	6.7833	A
B	60	6.7333	A
C	60	5.9667	B
A	60	4.5000	C

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.97%



## Quantative Descriptive Analysis: Taste Attribute

26-Sep-14 11:44:00 AM

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### Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	4.850	0.203	1.571
B	6.633	0.116	0.901
C	5.933	0.106	0.821
D	6.683	0.120	0.930

### One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	131.55	43.85	36.40	0.000
Error	236	284.30	1.20		
Total	239	415.85			

S = 1.098 R-Sq = 31.63% R-Sq(adj) = 30.76%

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev	CI
A	60	4.850	1.571	(---*---)
B	60	6.633	0.901	(---*---)
C	60	5.933	0.821	(---*---)
D	60	6.683	0.930	(---*---)

4.80 5.40 6.00 6.60

Pooled StDev = 1.098

Grouping Information Using Tukey Method

	N	Mean	Grouping
D	60	6.683	A
B	60	6.633	A
C	60	5.933	B
A	60	4.850	C

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.97%

## Quantative Descriptive Analysis: Dryness Attribute

26-Sep-14 11:49:50 AM

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## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	4.700	0.165	1.280
B	4.850	0.190	1.471
C	5.250	0.241	1.865
D	5.017	0.189	1.467

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	10.01	3.34	1.42	0.239
Error	236	556.48	2.36		
Total	239	566.50			

S = 1.536 R-Sq = 1.77% R-Sq(adj) = 0.52%

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev	CI Lower	CI Upper
A	60	4.700	1.280	3.100	6.300
B	60	4.850	1.471	2.900	6.800
C	60	5.250	1.865	3.100	7.400
D	60	5.017	1.467	3.500	6.500

4.55 4.90 5.25 5.60

Pooled StDev = 1.536

## Grouping Information Using Tukey Method

	N	Mean	Grouping
C	60	5.250	A
D	60	5.017	A
B	60	4.850	A
A	60	4.700	A

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.97%

## Quantative Descriptive Analysis: Aroma Attribute

26-Sep-14 12:06:44 PM

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### Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	6.200	0.212	1.645
B	6.750	0.108	0.836
C	5.800	0.174	1.350
D	6.750	0.132	1.019

### One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	38.55	12.85	8.20	0.000
Error	236	369.70	1.57		
Total	239	408.25			

S = 1.252 R-Sq = 9.44% R-Sq(adj) = 8.29%

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev
A	60	6.200	1.645
B	60	6.750	0.836
C	60	5.800	1.350
D	60	6.750	1.019

5.60 6.00 6.40 6.80

Pooled StDev = 1.252

Grouping Information Using Tukey Method

	N	Mean	Grouping
D	60	6.750	A
B	60	6.750	A
A	60	6.200	A B
C	60	5.800	B

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.97%

## Quantative Descriptive Analysis: Appearance Attribute

26-Sep-14 12:12:58 PM

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### Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	4.317	0.138	1.066
B	7.317	0.118	0.911
C	5.550	0.224	1.731
D	7.600	0.137	1.061

### One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	430.58	143.53	94.29	0.000
Error	236	359.22	1.52		
Total	239	789.80			

S = 1.234 R-Sq = 54.52% R-Sq(adj) = 53.94%

Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev
A	60	4.317	1.066	(--*--)
B	60	7.317	0.911	(--*--)
C	60	5.550	1.731	(--*--)
D	60	7.600	1.061	(--*--)

Pooled StDev = 1.234

#### Grouping Information Using Tukey Method

	N	Mean	Grouping
D	60	7.600	A
B	60	7.317	A
C	60	5.550	B
A	60	4.317	C

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.97%

## Hedonic/ Liking test Result

26-Sep-14 12:20:12 PM

## Descriptive Statistics: A, B, C, D

Variable	Mean	SE Mean	StDev
A	4.383	0.124	0.958
B	5.9333	0.0708	0.5482
C	5.067	0.109	0.841
D	6.2333	0.0901	0.6979

## One-way ANOVA: A, B, C, D

Source	DF	SS	MS	F	P
Factor	3	127.412	42.471	70.40	0.000
Error	236	142.383	0.603		
Total	239	269.796			

S = 0.7767 R-Sq = 47.23% R-Sq(adj) = 46.55%

Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev
A	60	4.3833	0.9583	(--*--)
B	60	5.9333	0.5482	(---*---)
C	60	5.0667	0.8410	(---*---)
D	60	6.2333	0.6979	(---*---)

4.20 4.80 5.40 6.00

Pooled StDev = 0.7767

## Grouping Information Using Tukey Method

	N	Mean	Grouping
D	60	6.2333	A
B	60	5.9333	A
C	60	5.0667	B
A	60	4.3833	C

Means that do not share a letter are significantly different.

Tukey 95% Simultaneous Confidence Intervals  
All Pairwise Comparisons

Individual confidence level = 98.97%