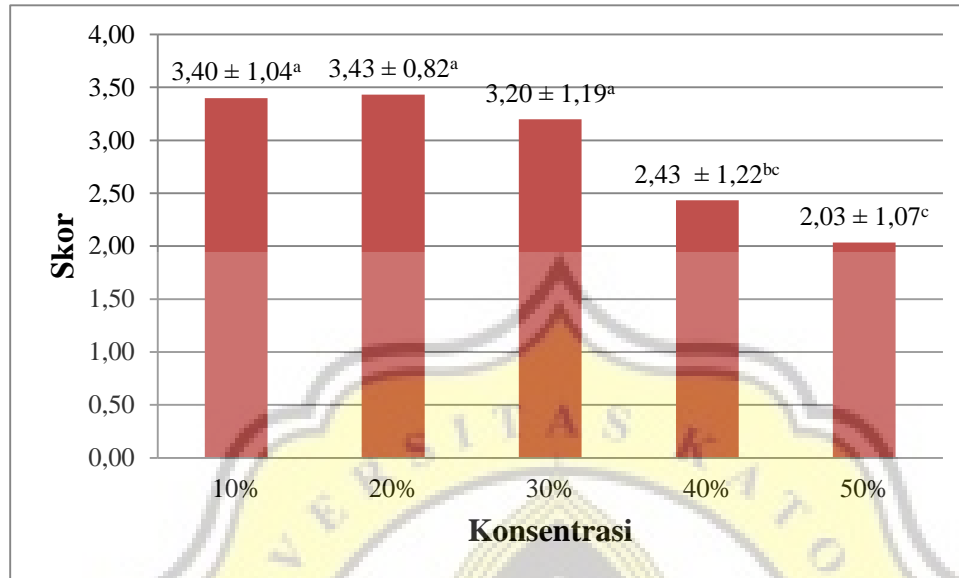
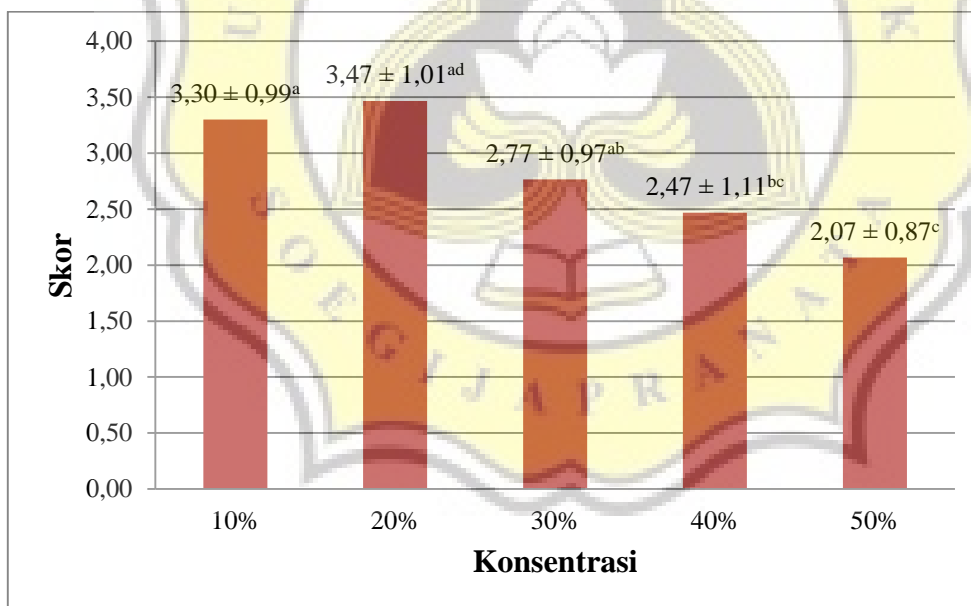


7. LAMPIRAN

Lampiran 1. Hasil Uji Sensori Parameter Rasa pada Penelitian Pendahuluan



Lampiran 2. Hasil Uji Sensori Parameter *Aftertaste* pada Penelitian Pendahuluan



Lampiran 3. Hasil Uji Mann-Whitney Parameter Tekstur pada Penelitian Pendahuluan

| Ranks | | | | |
|----------|-------|----|-----------|--------------|
| | Sa... | N | Mean Rank | Sum of Ranks |
| Kesukaan | 10% | 30 | 31.02 | 930.50 |
| | 20% | 30 | 29.98 | 899.50 |
| | Total | 60 | | |

Test Statistics^a

| | Kesukaan |
|------------------------|----------|
| Mann-Whitney U | 434.500 |
| Wilcoxon W | 899.500 |
| Z | -.242 |
| Asymp. Sig. (2-tailed) | .809 |

a. Grouping Variable: Sampel

Lampiran 4. Hasil Uji Mann-Whitney Parameter Rasa pada Penelitian Pendahuluan

| Ranks | | | | |
|----------|-------|----|-----------|--------------|
| | Sa... | N | Mean Rank | Sum of Ranks |
| Kesukaan | 10% | 30 | 30.90 | 927.00 |
| | 20% | 30 | 30.10 | 903.00 |
| | Total | 60 | | |

Test Statistics^a

| | Kesukaan |
|------------------------|----------|
| Mann-Whitney U | 438.000 |
| Wilcoxon W | 903.000 |
| Z | -.186 |
| Asymp. Sig. (2-tailed) | .852 |

a. Grouping Variable: Sampel

Lampiran 5. Hasil Uji Mann-Whitney Parameter *Aftertaste* pada Penelitian Pendahuluan

| Ranks | | | | |
|----------|-------|----|-----------|--------------|
| | Sa... | N | Mean Rank | Sum of Ranks |
| Kesukaan | 10% | 30 | 29.40 | 882.00 |
| | 20% | 30 | 31.60 | 948.00 |
| | Total | 60 | | |

Test Statistics^a

| | Kesukaan |
|------------------------|----------|
| Mann-Whitney U | 417.000 |
| Wilcoxon W | 882.000 |
| Z | -.516 |
| Asymp. Sig. (2-tailed) | .606 |

a. Grouping Variable: Sampel

Lampiran 6. Hasil Uji Mann-Whitney Parameter *Overall* pada Penelitian Pendahuluan

Ranks

| | Sa... | N | Mean Rank | Sum of Ranks |
|----------|-------|----|-----------|--------------|
| Kesukaan | 10% | 30 | 29.22 | 876.50 |
| | 20% | 30 | 31.78 | 953.50 |
| | Total | 60 | | |

Test Statistics^a

| | Kesukaan |
|------------------------|----------|
| Mann-Whitney U | 411.500 |
| Wilcoxon W | 876.500 |
| Z | -.607 |
| Asymp. Sig. (2-tailed) | .544 |

a. Grouping Variable: Sampel

Lampiran 7. Normalitas Data Penelitian Utama

Tests of Normality

| Konsentrasi | | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
|-------------|----|---------------------------------|----|-------------------|--------------|----|------|
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| SolubleCd | 10 | .347 | 5 | .049 | .789 | 5 | .065 |
| | 15 | .257 | 5 | .200 [*] | .928 | 5 | .584 |
| | 20 | .248 | 5 | .200 [*] | .869 | 5 | .263 |
| InsolubleCd | 10 | .221 | 5 | .200 [*] | .915 | 5 | .497 |
| | 15 | .329 | 5 | .081 | .841 | 5 | .168 |
| | 20 | .235 | 5 | .200 [*] | .913 | 5 | .486 |
| SolubleCu | 10 | .244 | 5 | .200 [*] | .926 | 5 | .567 |
| | 15 | .211 | 5 | .200 [*] | .972 | 5 | .891 |
| | 20 | .259 | 5 | .200 [*] | .863 | 5 | .238 |
| InsolubleCu | 10 | .315 | 5 | .118 | .802 | 5 | .084 |
| | 15 | .280 | 5 | .200 [*] | .915 | 5 | .497 |
| | 20 | .239 | 5 | .200 [*] | .910 | 5 | .465 |

a. Lilliefors Significance Correction

Lampiran 8. Homogenitas Data Penelitian Utama

Test of Homogeneity of Variances

| | Levene Statistic | df1 | df2 | Sig. |
|----------|------------------|-----|-----|------|
| TotalSCd | 1.815 | 2 | 12 | .205 |
| TotalICd | .244 | 2 | 12 | .788 |
| TotalSCu | .731 | 2 | 12 | .502 |
| TotalICu | 2.871 | 2 | 12 | .096 |

Lampiran 9. Analisa *One-Way Anova* Data Penelitian Utama

ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|----------|----------------|----------------|----|-------------|--------|------|
| TotalSCd | Between Groups | 208.059 | 2 | 104.029 | .108 | .899 |
| | Within Groups | 11604.957 | 12 | 967.080 | | |
| | Total | 11813.016 | 14 | | | |
| TotalICd | Between Groups | 148.474 | 2 | 74.237 | .226 | .801 |
| | Within Groups | 3946.537 | 12 | 328.878 | | |
| | Total | 4095.010 | 14 | | | |
| TotalSCu | Between Groups | 727.757 | 2 | 363.879 | 7.897 | .006 |
| | Within Groups | 552.915 | 12 | 46.076 | | |
| | Total | 1280.673 | 14 | | | |
| TotalICu | Between Groups | 515.036 | 2 | 257.518 | 13.707 | .001 |
| | Within Groups | 225.453 | 12 | 18.788 | | |
| | Total | 740.489 | 14 | | | |

Lampiran 10. Penyajian Deskriptif Data Penelitian Utama

Descriptives

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|----------|-------|----|----------|----------------|------------|----------------------------------|-------------|---------|---------|
| | | | | | | Lower Bound | Upper Bound | | |
| TotalSCd | 10 | 5 | 1.7970E2 | 22.03567 | 9.85465 | 152.3373 | 207.0591 | 163.96 | 213.26 |
| | 15 | 5 | 1.7497E2 | 39.08071 | 17.47742 | 126.4454 | 223.4957 | 120.26 | 215.74 |
| | 20 | 5 | 1.8408E2 | 29.80548 | 13.32942 | 147.0828 | 221.0996 | 154.56 | 220.01 |
| | Total | 15 | 1.7959E2 | 29.04801 | 7.50016 | 163.5004 | 195.6729 | 120.26 | 220.01 |
| TotalICd | 10 | 5 | 64.8179 | 19.60869 | 8.76927 | 40.4705 | 89.1653 | 46.14 | 93.06 |
| | 15 | 5 | 57.3884 | 15.34639 | 6.86311 | 38.3333 | 76.4435 | 31.44 | 71.99 |
| | 20 | 5 | 62.8763 | 19.14738 | 8.56297 | 39.1017 | 86.6510 | 43.54 | 93.56 |
| | Total | 15 | 61.6942 | 17.10265 | 4.41589 | 52.2231 | 71.1653 | 31.44 | 93.56 |
| TotalSCu | 10 | 5 | 1.4719E2 | 8.27230 | 3.69949 | 136.9155 | 157.4583 | 132.81 | 153.50 |
| | 15 | 5 | 1.5378E2 | 4.47220 | 2.00003 | 148.2300 | 159.3360 | 147.89 | 160.28 |
| | 20 | 5 | 1.6411E2 | 7.05872 | 3.15586 | 155.3499 | 172.8740 | 158.36 | 175.27 |
| | Total | 15 | 1.5503E2 | 9.56434 | 2.46950 | 149.7307 | 160.3238 | 132.81 | 175.27 |
| TotalICu | 10 | 5 | 45.5837 | 2.68215 | 1.19949 | 42.2534 | 48.9140 | 43.29 | 48.61 |
| | 15 | 5 | 39.0818 | 1.65821 | .74158 | 37.0229 | 41.1407 | 36.96 | 41.61 |
| | 20 | 5 | 31.2510 | 6.81320 | 3.04696 | 22.7913 | 39.7107 | 20.26 | 38.45 |
| | Total | 15 | 38.6389 | 7.27270 | 1.87780 | 34.6114 | 42.6663 | 20.26 | 48.61 |

Lampiran 11. Uji Duncan Fase Terlarut Kadmium pada Penelitian Utama

TotalSCd

| | Konsentrasi | N | Subset for alpha = 0.05 | |
|---------------------|-------------|---|-------------------------|--|
| | | | 1 | |
| Duncan ^a | 15 | 5 | 174.9706 | |
| | 10 | 5 | 179.6982 | |
| | 20 | 5 | 184.0912 | |
| | Sig. | | .667 | |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 12. Uji Duncan Fase Tidak Terlarut Kadmium pada Penelitian Utama

TotalICd

| | Konsentrasi | N | Subset for alpha = 0.05 | |
|---------------------|-------------|---|-------------------------|--|
| | | | 1 | |
| Duncan ^a | 15 | 5 | 57.3884 | |
| | 20 | 5 | 62.8763 | |
| | 10 | 5 | 64.8179 | |
| | Sig. | | .550 | |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 13. Uji Duncan Fase Terlarut Tembaga pada Penelitian Utama

TotalSCu

| | Konsentrasi | N | Subset for alpha = 0.05 | |
|---------------------|-------------|---|-------------------------|----------|
| | | | 1 | 2 |
| Duncan ^a | 10 | 5 | 147.1869 | |
| | 15 | 5 | 153.7830 | |
| | 20 | 5 | | 164.1120 |
| | Sig. | | .150 | 1.000 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 14. Uji Duncan Fase Tidak Terlarut Tembaga pada Penelitian Utama

TotalCu

| | Konsentrasi | N | Subset for alpha = 0.05 | | |
|---------------------|-------------|---|-------------------------|---------|---------|
| | | | 1 | 2 | 3 |
| Duncan ^a | 20 | 5 | 31.2510 | | |
| | 15 | 5 | | 39.0818 | |
| | 10 | 5 | | | 45.5837 |
| | Sig. | | 1.000 | 1.000 | 1.000 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 15. Uji Duncan *Recovery* Fase Terlarut Kadmium pada Penelitian Utama

RecoverySCd

| | Konsentrasi | N | Subset for alpha = 0.05 |
|---------------------|-------------|---|-------------------------|
| | | | 1 |
| Duncan ^a | 15 | 5 | 43.7426 |
| | 10 | 5 | 44.9246 |
| | 20 | 5 | 46.0228 |
| | Sig. | | .667 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 16. Uji Duncan *Recovery* Fase Tidak Terlarut Kadmium pada Penelitian Utama

RecoveryICd

| | Konsentrasi | N | Subset for alpha = 0.05 |
|---------------------|-------------|---|-------------------------|
| | | | 1 |
| Duncan ^a | 15 | 5 | 14.3471 |
| | 20 | 5 | 15.7191 |
| | 10 | 5 | 16.2045 |
| | Sig. | | .550 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 17. Uji Duncan *Recovery* Total Kadmium pada Penelitian Utama

RecoverySICd

| | Konsentrasi | N | Subset for alpha = 0.05 |
|---------------------|-------------|---|-------------------------|
| | | | 1 |
| Duncan ^a | 15 | 5 | 58.0897 |
| | 10 | 5 | 61.1290 |
| | 20 | 5 | 61.7419 |
| | Sig. | | .612 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 18. Uji Duncan *Recovery* Fase Terlarut Tembaga pada Penelitian Utama

RecoverySCu

| | Konsentrasi | N | Subset for alpha = 0.05 | |
|---------------------|-------------|---|-------------------------|---------|
| | | | 1 | 2 |
| Duncan ^a | 10 | 5 | 73.5934 | |
| | 15 | 5 | 76.8915 | |
| | 20 | 5 | | 82.0560 |
| | Sig. | | .150 | 1.000 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 19. Uji Duncan *Recovery* Fase Tidak Terlarut Tembaga pada Penelitian Utama

RecoveryICu

| | Konsentrasi | N | Subset for alpha = 0.05 | | |
|---------------------|-------------|---|-------------------------|---------|---------|
| | | | 1 | 2 | 3 |
| Duncan ^a | 20 | 5 | 15.6255 | | |
| | 15 | 5 | | 19.5409 | |
| | 10 | 5 | | | 22.7919 |
| | Sig. | | 1.000 | 1.000 | 1.000 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 20. Uji Duncan *Recovery* Total Tembaga pada Penelitian Utama

RecoverySICu

| | Konsentrasi | N | Subset for alpha = 0.05 |
|---------------------|-------------|---|----------------------------|
| | | | 1 |
| Duncan ^a | 10 | 5 | 96.3853 |
| | 15 | 5 | 96.4324 |
| | 20 | 5 | 97.6815 |
| | Sig. | | .402 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 21. Perhitungan Simulasi Pengikatan Logam Berat

- Asumsi :

Volume darah = 5,3 L

Konsentrasi aman Cd dalam darah = 10,6 µg

Kontaminasi Cd dalam darah = 31,8 µg

Batas aman Cd dalam darah = 2 µg/L

Jumlah asupan *cupcake* = 1-3 buah/hari

- Produk Cupcake + Pektin gel 10%

Efisiensi Pengikatan Cd = 61,129%

Berat 1 cupcake = 8 gram

Rasio 1 cupcake/darah = $\frac{8}{5300}$ gram/ml

Rasio cupcake/larutan = $\frac{1}{51}$ gram/ml

- Laju Pengikatan : $k = \frac{\text{Rasio cupcake/darah}}{\text{Rasio cupcake/larutan}} \times \text{Efisiensi Pengikatan Cd}$

Jumlah asupan 1 buah :

$$\text{Laju Pengikatan} = \frac{8/5300}{1/51} \times 61,129\% = 0,047\% = 0,00047 \text{ hari}^{-1}$$

Jumlah asupan 2 buah :

$$\text{Laju Pengikatan} = \frac{16/5300}{1/51} \times 61,129\% = 0,094\% = 0,00094 \text{ hari}^{-1}$$

Jumlah asupan 3 buah :

$$\text{Laju Pengikatan} = \frac{32/5300}{1/51} \times 61,129\% = 0,141\% = 0,00141 \text{ hari}^{-1}$$

- Waktu Menuju Konsentrasi Aman :

$$X(t) = X_0 \cdot e^{-kt} \quad tka = \frac{\ln X(0) - \ln X(t)}{k}$$

$$\text{Jumlah asupan 1 buah : } tka = \frac{\ln(31,8) - \ln X(10,6)}{0,00047} = 2335 \text{ hari}$$

$$\text{Jumlah asupan 2 buah : } tka = \frac{\ln(31,8) - \ln X(10,6)}{0,00094} = 1167 \text{ hari}$$

$$\text{Jumlah asupan 3 buah : } tka = \frac{\ln(31,8) - \ln X(10,6)}{0,00141} = 778 \text{ hari}$$

- Waktu Paruh ($t = 0,5$)

$$\frac{X(t)}{X(0)} = e^{-kt} \quad t(0,5) = \frac{\ln 0,5}{-k}$$

$$\text{Jumlah asupan 1 buah : } t(0,5) = \frac{\ln 0,5}{-0,00047} = 1473 \text{ hari}$$

$$\text{Jumlah asupan 2 buah : } t(0,5) = \frac{\ln 0,5}{-0,00094} = 736 \text{ hari}$$

$$\text{Jumlah asupan 3 buah : } t(0,5) = \frac{\ln 0,5}{-0,00141} = 491 \text{ hari}$$