LAMPIRAN

Lampiran 1. SNI *Cookies*

Tabel 13. Standar Mutu *Cookies* (SNI 01-2973-1992)

Kriteria uji	Klasifikasi
Kalori (kalori / 100 gram)	Minimum 400
Air (%)	Maksimum 5
Protein (%)	Minimum 9
Lemak (%)	Minimum 9.5
Karbohidrat (%)	Minimum 7
Abu (%)	Maksimum 1.5
Serat kasar (%)	Maksimum 0.5
Logam berbahaya	Negatif
Bau dan rasa	Normal dan tidak tengik
Warna	Normal

Sumber : BSN, 1992

Lampiran 2. Kuesioner Evaluasi Sensoris

UJI RANKING HEDONIK

Nama : Tanggal :

Produk : *cookies*

Atribut : warna

Instruksi :

Di hadapan Anda terdapat 4 sampel *cookies*. Amatilah sampel secara berurutan dari kiri ke kanan. Setelah mengamati semua sampel, Anda boleh mengulang sesering yang Anda perlukan. Urutkan sampel dari yang warnanya paling Anda sukai (= 4) hingga yang paling kurang Anda sukai (= 1).

Kode sampel	Ranking (tidak boleh dobel)
_____	_____
_____	_____
_____	_____
_____	_____

Terima kasih

UJI RANKING HEDONIK

Nama : Tanggal :

Produk : *cookies*

Atribut : rasa

Instruksi :

Di hadapan Anda terdapat 4 sampel *cookies*. Cicipilah sampel secara berurutan dari kiri ke kanan. Minumlah air setiap kali akan berganti sampel. Setelah merasakan semua sampel, Anda boleh mengulang sesering yang Anda perlukan. Urutkan sampel dari yang rasanya paling Anda sukai (= 4) hingga yang paling kurang Anda sukai (= 1).

Kode sampel	Ranking (tidak boleh dobel)
_____	_____
_____	_____
_____	_____
_____	_____

Terima kasih

UJI RANKING HEDONIK

Nama : Tanggal :

Produk : *cookies*

Atribut : aroma

Instruksi :

Di hadapan Anda terdapat 4 sampel *cookies*. Ciumlah sampel secara berurutan dari kiri ke kanan. Setelah mencium semua sampel, Anda boleh mengulang sesering yang Anda perlukan. Urutkan sampel dari yang aromanya paling Anda sukai (= 4) hingga yang paling kurang Anda sukai (= 1).

Kode sampel	Ranking (tidak boleh dobel)
_____	_____
_____	_____
_____	_____
_____	_____

Terima kasih

UJI RANKING HEDONIK

Nama : Tanggal :

Produk : *cookies*

Atribut : tekstur

Instruksi :

Di hadapan Anda terdapat 4 sampel *cookies*. Gigitlah sampel secara berurutan dari kiri ke kanan. Setelah menggigit semua sampel, Anda boleh mengulang sesering yang Anda perlukan. Urutkan sampel dari yang teksturnya paling Anda sukai (= 4) hingga yang paling kurang Anda sukai (= 1).

Kode sampel	Ranking (tidak boleh dobel)
_____	_____
_____	_____
_____	_____
_____	_____

Terima kasih

UJI RANKING HEDONIK

Nama : Tanggal :

Produk : *cookies*

Atribut : *overall*

Instruksi :

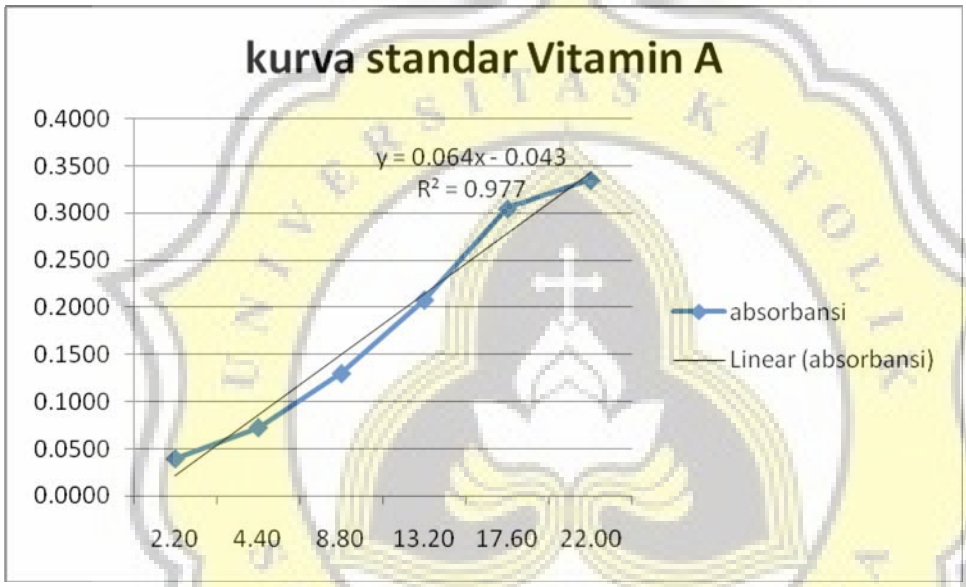
Di hadapan Anda terdapat 4 sampel *cookies*. Amati sampel secara berurutan dari kiri ke kanan. Setelah mengamati semua sampel, Anda boleh mengulang sesering yang Anda perlukan. Urutkan sampel dari yang paling Anda sukai (= 4) hingga yang paling kurang Anda sukai (= 1).

Kode sampel	Ranking (tidak boleh dobel)
_____	_____
_____	_____
_____	_____
_____	_____

Terima kasih

Lampiran 3. Kurva Standar β-Karoten

Konsentrasi (ppm)	Absorbansi
2,2	0,0400
4,4	0,0731
8,8	0,1303
13,2	0,2084
17,6	0,3049
22	0,0053



Lampiran 4. Perhitungan Umur Simpan

Contoh perhitngan umur simpan :

Dalam penelitian ini digunakan temperatur 40°C dengan RH 90% selama 28 hari, maka bila dikonversikan pada suhu kamar (25°C) menjadi :

Q = 2

ts = 28 hari

suhu ruang (T1) = 25°C

suhu ASLT (T2) = 40°C

δT = T2-T1 = 40°C - 30°C = 10°C

ts (T1) = ts (T2) x $Q^{\delta T/10}$

= 28 hari x $2^{10/10}$

= 28 hari x 2

= 56 hari

= 8 minggu

Lampiran 5. Hasil Analisa SPSS

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	perlakuan	Statistic	df	Sig.	Statistic	df	Sig.
vit_A	kontrol 15	.146	6	.200*	.956	6	.786
	kontrol 18	.221	6	.200*	.955	6	.780
	kontrol 20	.193	6	.200*	.924	6	.533
	adonan kontrol	.232	6	.200*	.876	6	.251
	30% 15	.180	6	.200*	.945	6	.698
	30% 18	.175	6	.200*	.957	6	.797
	30% 20	.249	6	.200*	.949	6	.732
	adonan 30%	.181	6	.200*	.936	6	.629
	40% 15	.244	6	.200*	.953	6	.768
	40% 18	.193	6	.200*	.983	6	.966
	40% 20	.185	6	.200*	.938	6	.645
	adonan 40%	.195	6	.200*	.872	6	.233
	50% 15	.227	6	.200*	.890	6	.317
	50% 18	.320	6	.055	.717	6	.009
	50% 20	.193	6	.200*	.914	6	.466
	adonan 50%	.201	6	.200*	.908	6	.426
angka_TBA	kontrol 15	.244	6	.200*	.903	6	.394
	kontrol 18	.185	6	.200*	.974	6	.918
	kontrol 20	.186	6	.200*	.961	6	.828
	adonan kontrol	.214	6	.200*	.958	6	.804
	30% 15	.249	6	.200*	.892	6	.331
	30% 18	.174	6	.200*	.951	6	.748
	30% 20	.191	6	.200*	.937	6	.638
	adonan 30%	.226	6	.200*	.912	6	.452
	40% 15	.215	6	.200*	.898	6	.364
	40% 18	.146	6	.200*	.982	6	.960
	40% 20	.203	6	.200*	.934	6	.613
	adonan 40%	.183	6	.200*	.940	6	.660
	50% 15	.167	6	.200*	.938	6	.646
	50% 18	.229	6	.200*	.896	6	.349
	50% 20	.185	6	.200*	.961	6	.824
	adonan 50%	.185	6	.200*	.972	6	.902
antioksidan	kontrol 15	.190	6	.200*	.893	6	.336
	kontrol 18	.196	6	.200*	.871	6	.230
	kontrol 20	.288	6	.132	.885	6	.291
	adonan kontrol	.240	6	.200*	.858	6	.183
	30% 15	.312	6	.070	.852	6	.164
	30% 18	.263	6	.200*	.841	6	.132
	30% 20	.247	6	.200*	.903	6	.394
	adonan 30%	.206	6	.200*	.907	6	.414
	40% 15	.303	6	.091	.887	6	.304
	40% 18	.166	6	.200*	.951	6	.750
	40% 20	.210	6	.200*	.926	6	.551
	adonan 40%	.167	6	.200*	.957	6	.799
	50% 15	.203	6	.200*	.971	6	.898
	50% 18	.254	6	.200*	.809	6	.071
	50% 20	.203	6	.200*	.938	6	.645
	adonan 50%	.220	6	.200*	.957	6	.796
lemak	kontrol 15	.256	6	.200*	.828	6	.104
	kontrol 18	.207	6	.200*	.869	6	.223
	kontrol 20	.272	6	.187	.856	6	.175
	adonan kontrol	.248	6	.200*	.858	6	.182
	30% 15	.193	6	.200*	.952	6	.759
	30% 18	.223	6	.200*	.910	6	.438
	30% 20	.143	6	.200*	.979	6	.945
	adonan 30%	.159	6	.200*	.968	6	.880
	40% 15	.213	6	.200*	.884	6	.288
	40% 18	.223	6	.200*	.891	6	.322
	40% 20	.203	6	.200*	.890	6	.317
	adonan 40%	.248	6	.200*	.905	6	.407
	50% 15	.288	6	.130	.772	6	.032
	50% 18	.168	6	.200*	.980	6	.953
	50% 20	.263	6	.200*	.851	6	.159
	adonan 50%	.308	6	.077	.871	6	.231

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Normalitas Uji Fisik

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	perlakuan	Statistic	df	Sig.	Statistic	df	Sig.
hardness	kontrol 15	.225	6	.200*	.863	6	.199
	kontrol 18	.186	6	.200*	.971	6	.899
	kontrol 20	.217	6	.200*	.897	6	.355
	adonan kontrol	.313	6	.067	.756	6	.023
	30% 15	.163	6	.200*	.946	6	.710
	30% 18	.268	6	.200*	.858	6	.184
	30% 20	.176	6	.200*	.971	6	.902
	adonan 30%	.308	6	.077	.790	6	.047
	40% 15	.196	6	.200*	.934	6	.612
	40% 18	.203	6	.200*	.897	6	.354
	40% 20	.318	6	.057	.880	6	.269
	adonan 40%	.201	6	.200*	.961	6	.826
	50% 15	.227	6	.200*	.879	6	.264
	50% 18	.137	6	.200*	.969	6	.883
	50% 20	.184	6	.200*	.906	6	.409
	adonan 50%	.183	6	.200*	.899	6	.370
lightness	kontrol 15	.199	6	.200*	.936	6	.624
	kontrol 18	.229	6	.200*	.841	6	.133
	kontrol 20	.184	6	.200*	.975	6	.924
	adonan kontrol	.316	6	.062	.792	6	.050
	30% 15	.173	6	.200*	.927	6	.559
	30% 18	.234	6	.200*	.939	6	.647
	30% 20	.257	6	.200*	.906	6	.411
	adonan 30%	.163	6	.200*	.967	6	.875
	40% 15	.186	6	.200*	.956	6	.790
	40% 18	.288	6	.132	.871	6	.229
	40% 20	.139	6	.200*	.991	6	.990
	adonan 40%	.220	6	.200*	.946	6	.707
	50% 15	.256	6	.200*	.851	6	.161
	50% 18	.305	6	.086	.727	6	.012
	50% 20	.294	6	.115	.810	6	.072
	adonan 50%	.193	6	.200*	.910	6	.439
a	kontrol 15	.182	6	.200*	.944	6	.692
	kontrol 18	.249	6	.200*	.870	6	.228
	kontrol 20	.287	6	.134	.830	6	.109
	adonan kontrol	.210	6	.200*	.917	6	.487
	30% 15	.403	6	.003	.595	6	.000
	30% 18	.187	6	.200*	.903	6	.392
	30% 20	.174	6	.200*	.958	6	.802
	adonan 30%	.228	6	.200*	.932	6	.599
	40% 15	.231	6	.200*	.899	6	.366
	40% 18	.233	6	.200*	.868	6	.218
	40% 20	.227	6	.200*	.900	6	.373
	adonan 40%	.202	6	.200*	.927	6	.556
	50% 15	.173	6	.200*	.937	6	.638
	50% 18	.248	6	.200*	.932	6	.594
	50% 20	.185	6	.200*	.916	6	.477
	adonan 50%	.222	6	.200*	.876	6	.252
b	kontrol 15	.275	6	.177	.780	6	.039
	kontrol 18	.258	6	.200*	.934	6	.612
	kontrol 20	.263	6	.200*	.887	6	.301
	adonan kontrol	.167	6	.200*	.954	6	.770
	30% 15	.183	6	.200*	.929	6	.573
	30% 18	.260	6	.200*	.897	6	.356
	30% 20	.187	6	.200*	.936	6	.624
	adonan 30%	.220	6	.200*	.922	6	.519
	40% 15	.298	6	.104	.814	6	.078
	40% 18	.192	6	.200*	.886	6	.300
	40% 20	.191	6	.200*	.931	6	.588
	adonan 40%	.179	6	.200*	.891	6	.321
	50% 15	.242	6	.200*	.869	6	.223
	50% 18	.263	6	.200*	.897	6	.356
	50% 20	.229	6	.200*	.881	6	.275
	adonan 50%	.179	6	.200*	.964	6	.847

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Normalitas Variabel *Baking loss*

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	perlakuan	Statistic	df	Sig.	Statistic	df	Sig.
baking_loss	kontrol 15 mnt	.217	6	.200*	.900	6	.371
	kontrol 18 mnt	.206	6	.200*	.967	6	.869
	kontrol 20 mnt	.204	6	.200*	.960	6	.822
	30% CPO 15 mr	.339	6	.030	.784	6	.042
	30% CPO 18 mr	.240	6	.200*	.886	6	.299
	30% CPO 20 mr	.171	6	.200*	.930	6	.582
	40% CPO 15 mr	.187	6	.200*	.933	6	.604
	40% CPO 18 mr	.265	6	.200*	.927	6	.556
	40% CPO 20 mr	.143	6	.200*	.975	6	.922
	50% CPO 15 mr	.265	6	.200*	.870	6	.225
	50% CPO 18 mr	.165	6	.200*	.965	6	.856
	50% CPO 20 mr	.143	6	.200*	.978	6	.942

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Normalitas Uji Kimia Hari ke-7

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	perlakuan	Statistic	df	Sig.	Statistic	df	Sig.
vit_A	kontrol 18	.167	6	.200*	.981	6	.956
	30% 18	.167	6	.200*	.982	6	.960
	40% 18	.296	6	.109	.905	6	.406
	50% 18	.165	6	.200*	.976	6	.933
angka_TBA	kontrol 18	.115	6	.200*	.996	6	.998
	30% 18	.167	6	.200*	.960	6	.817
	40% 18	.238	6	.200*	.950	6	.737
	50% 18	.183	6	.200*	.940	6	.660
antioksidan	kontrol 18	.163	6	.200*	.930	6	.577
	30% 18	.167	6	.200*	.928	6	.565
	40% 18	.149	6	.200*	.969	6	.888
	50% 18	.202	6	.200*	.898	6	.362

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Normalitas Uji Kimia Hari ke-14

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	perlakuan	Statistic	df	Sig.	Statistic	df	Sig.
vit_A	kontrol 18	.230	6	.200*	.953	6	.763
	30% 18	.273	6	.184	.823	6	.094
	40% 18	.170	6	.200*	.952	6	.760
	50% 18	.157	6	.200*	.967	6	.874
angka_TBA	kontrol 18	.122	6	.200*	.982	6	.961
	30% 18	.248	6	.200*	.871	6	.230
	40% 18	.302	6	.092	.867	6	.215
	50% 18	.172	6	.200*	.954	6	.772
antioksidan	kontrol 18	.270	6	.195	.923	6	.529
	30% 18	.301	6	.094	.865	6	.205
	40% 18	.223	6	.200*	.891	6	.322
	50% 18	.150	6	.200*	.977	6	.937

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Normalitas Uji Kimia Hari ke-21

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	perlakuan	Statistic	df	Sig.	Statistic	df	Sig.
vit_A	kontrol 18	.226	6	.200*	.878	6	.260
	30% 18	.214	6	.200*	.958	6	.804
	40% 18	.167	6	.200*	.941	6	.671
	50% 18	.193	6	.200*	.947	6	.718
angka_TBA	kontrol 18	.215	6	.200*	.901	6	.380
	30% 18	.289	6	.128	.853	6	.165
	40% 18	.197	6	.200*	.861	6	.194
	50% 18	.204	6	.200*	.918	6	.493
antioksidan	kontrol 18	.174	6	.200*	.962	6	.838
	30% 18	.243	6	.200*	.962	6	.834
	40% 18	.146	6	.200*	.988	6	.983
	50% 18	.101	6	.200*	.996	6	.999

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Normalitas Uji Kimia Hari ke-28

Tests of Normality

		Kolmogorov-Smirnov [a]			Shapiro-Wilk		
	perlakuan	Statistic	df	Sig.	Statistic	df	Sig.
vit_A	kontrol 18	.216	6	.200*	.938	6	.643
	30% 18	.257	6	.200*	.867	6	.214
	40% 18	.241	6	.200*	.903	6	.389
	50% 18	.164	6	.200*	.939	6	.648
angka_TBA	kontrol 18	.143	6	.200*	.989	6	.987
	30% 18	.187	6	.200*	.969	6	.885
	40% 18	.219	6	.200*	.941	6	.667
	50% 18	.121	6	.200*	.983	6	.964
antioksidan	kontrol 18	.117	6	.200*	.984	6	.969
	30% 18	.220	6	.200*	.859	6	.184
	40% 18	.161	6	.200*	.957	6	.797
	50% 18	.196	6	.200*	.918	6	.489

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Vitamin A

Tests of Between-Subjects Effects

Dependent Variable: vitamin_A

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1967622.161[a]	6	327937.027	1923.925	.000
Intercept	14166373.3	1	14166373.31	83110.602	.000
persen_CPO	1902475.467	3	634158.489	3720.451	.000
waktu_oven	65146.694	3	21715.565	127.400	.000
Error	15170.233	89	170.452		
Total	16149165.7	96			
Corrected Total	1982792.394	95			

a. R Squared = .992 (Adjusted R Squared = .992)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

vitamin_A

Duncan [a,b]

persen_CPO	N	Subset 1	2	3	4
0%	24	151.69096			
30%	24		409.54238		
40%	24			447.95463	
50%	24				527.38688
Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 170.452.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

waktu_oven
Homogeneous Subsets

vitamin_A

Duncan [a,b]

waktu_oven	N	Subset 1	2	3	4
20 mnt	24	352.54792			
18 mnt	24		368.64871		
15 mnt	24			394.13763	
0 mnt	24				421.24058
Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 170.452.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Aktivitas Antioksidan

Tests of Between-Subjects Effects

Dependent Variable: antioksidan

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6115.574[a]	6	1019.262	1550.475	.000
Intercept	88716.442	1	88716.442	134953.1	.000
persen_CPO	5529.226	3	1843.075	2803.638	.000
waktu_oven	586.348	3	195.449	297.312	.000
Error	58.507	89	.657		
Total	94890.523	96			
Corrected Total	6174.081	95			

a. R Squared = .991 (Adjusted R Squared = .990)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

antioksidan

Duncan [a,b]

persen_CPO	N	Subset 1	2	3	4
0%	24	21.61529			
30%	24		24.52413		
40%	24			35.35754	
50%	24				40.10104
Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .657.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

waktu_oven
Homogeneous Subsets

antioksidan

Duncan [a,b]

waktu_oven	N	Subset 1	2	3	4
20 mnt	24	27.08613			
18 mnt	24		29.41504		
15 mnt	24			31.27408	
0 mnt	24				33.82275
Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .657.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Lemak

Tests of Between-Subjects Effects

Dependent Variable: lemak

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	25.722[a]	6	4.287	8.296	.000
Intercept	31914.059	1	31914.059	61760.484	.000
persen_CPO	11.285	3	3.762	7.280	.000
waktu_oven	14.437	3	4.812	9.313	.000
Error	45.990	89	.517		
Total	31985.771	96			
Corrected Total	71.712	95			

a. R Squared = .359 (Adjusted R Squared = .315)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

lemak

Duncan [a,b]

persen_CPO	N	Subset 1	2	3
0%	24	17.85725		
30%	24	18.01213	18.01213	
40%	24		18.30467	
50%	24			18.75750
Sig.		.457	.162	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .517.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

waktu_oven
Homogeneous Subsets

lemak

Duncan [a,b]

waktu_oven	N	Subset 1	Subset 2
0 mnt	24	17.59996	
15 mnt	24		18.30558
18 mnt	24		18.37383
20 mnt	24		18.65217
Sig.		1.000	.118

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .517.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Angka TBA

Tests of Between-Subjects Effects

Dependent Variable: angka_TBA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.518[a]	6	.086	80.729	.000
Intercept	3.766	1	3.766	3517.803	.000
persen_CPO	.108	3	.036	33.635	.000
waktu_oven	.410	3	.137	127.823	.000
Error	.095	89	.001		
Total	4.379	96			
Corrected Total	.614	95			

a. R Squared = .845 (Adjusted R Squared = .834)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

angka_TBA

Duncan [a,b]

persen_CPO	N	Subset 1	Subset 2
30%	24	.14004	
50%	24		.21475
0%	24		.21746
40%	24		.21996
Sig.		1.000	.608

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .001.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

waktu_oven
Homogeneous Subsets

angka_TBA

Duncan [a,b]

waktu_oven	N	Subset 1	2	3	4
0 mnt	24	.11638			
18 mnt	24		.15725		
15 mnt	24			.23413	
20 mnt	24				.28446
Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .001.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Vitamin A selama Penyimpanan

Tests of Between-Subjects Effects

Dependent Variable: vitamin_A

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2072212.115[a]	7	296030.302	976.517	.000
Intercept	13496226.5	1	13496226.50	44520.076	.000
persen_CPO	1965911.202	3	655303.734	2161.654	.000
umur.simpan	106300.912	4	26575.228	87.664	.000
Error	33952.713	112	303.149		
Total	15602391.3	120			
Corrected Total	2106164.828	119			

a. R Squared = .984 (Adjusted R Squared = .983)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

vitamin_A

Duncan [a,b]

persen_CPO	N	Subset 1	2	3	4
0%	30	128.97543			
30%	30		338.23883		
40%	30			403.82157	
50%	30				470.41743
Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 303.149.

a. Uses Harmonic Mean Sample Size = 30.000.

b. Alpha = .05.

waktu.simpan
Homogeneous Subsets

vitamin_A

Duncan [a,b]

umur.simpan	N	Subset 1	2	3	4
hari ke 28	24	290.09192			
hari ke 21	24		315.48300		
hari ke 14	24			337.71654	
hari ke 7	24				364.87642
hari ke 0	24				368.64871
Sig.		1.000	1.000	1.000	.455

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 303.149.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Aktivitas Antioksidan selama Penyimpanan

Tests of Between-Subjects Effects

Dependent Variable: antioxidan

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	11246.323[a]	7	1606.618	177.037	.000
Intercept	13166.216	1	13166.216	1450.813	.000
persen_CPO	456.979	3	152.326	16.785	.000
umur.simpan	10789.344	4	2697.336	297.225	.000
Error	1016.407	112	9.075		
Total	25428.946	120			
Corrected Total	12262.730	119			

a. R Squared = .917 (Adjusted R Squared = .912)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

antioxidan

Duncan [a,b]

persen_CPO	N	Subset 1	2
0%	30	8.05613	
30%	30	9.17763	
40%	30		11.70060
50%	30		12.96427
Sig.		.152	.107

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 9.075.

a. Uses Harmonic Mean Sample Size = 30.000.

b. Alpha = .05.

waktu.simpan
Homogeneous Subsets

antioxidan

Duncan [a,b]

umur.simpan	N	Subset 1	Subset 2
hari ke 28	24	5.05292	
hari ke 21	24	5.50021	
hari ke 14	24	5.90604	
hari ke 7	24	6.49908	
hari ke 0	24		29.41504
Sig.		.133	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 9.075.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Angka TBA selama Penyimpanan

Tests of Between-Subjects Effects

Dependent Variable: angka_TBA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	9.830[a]	7	1.404	25.635	.000
Intercept	20.142	1	20.142	367.694	.000
persen_CPO	3.607	3	1.202	21.947	.000
umur.simpan	6.223	4	1.556	28.402	.000
Error	6.135	112	.055		
Total	36.108	120			
Corrected Total	15.966	119			

a. R Squared = .616 (Adjusted R Squared = .592)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

angka_TBA

Duncan [a,b]

persen_CPO	N	Subset 1	Subset 2	Subset 3
50%	30	.22647		
30%	30	.33113	.33113	
40%	30		.38860	
0%	30			.69260
Sig.		.086	.344	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .055.

a. Uses Harmonic Mean Sample Size = 30.000.

b. Alpha = .05.

waktu.simpan
Homogeneous Subsets

angka_TBA

Duncan [a,b]

umur.simpan	N	Subset 1	Subset 2
hari ke 0	24	.15725	
hari ke 7	24	.24217	
hari ke 14	24	.28829	
hari ke 21	24		.62463
hari ke 28	24		.73617
Sig.		.069	.102

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .055.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Variabel *Hardness*

Tests of Between-Subjects Effects

Dependent Variable: hardness

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	152720865[a]	6	25453477.55	91.902	.000
Intercept	332438285	1	332438284.7	1200.302	.000
persen_CPO	9557050.342	3	3185683.447	11.502	.000
waktu_oven	143163815	3	47721271.65	172.302	.000
Error	24649634.1	89	276962.181		
Total	509808784	96			
Corrected Total	177370499	95			

a. R Squared = .861 (Adjusted R Squared = .852)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

hardness

Duncan [a,b]

persen_CPO	N	Subset 1	Subset 2
50%	24	1536.012	
30%	24	1761.603	
40%	24	1762.439	
0%	24		2383.493
Sig.		.164	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 276962.181.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

waktu_oven
Homogeneous Subsets

hardness

Duncan [a,b]

waktu_oven	N	Subset 1	Subset 2	Subset 3	Subset 4
0 mnt	24	330.67788			
15 mnt	24		1230.794		
18 mnt	24			2272.773	
20 mnt	24				3609.301
Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 276962.181.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Variabel *Baking Loss*

Tests of Between-Subjects Effects

Dependent Variable: baking_loss

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	230.004[a]	5	46.001	5441.610	.000
Intercept	3729.068	1	3729.068	441126.6	.000
persen_CPO	2.979	3	.993	117.478	.000
waktu_oven	227.024	2	113.512	13427.809	.000
Error	.558	66	.008		
Total	3959.629	72			
Corrected Total	230.561	71			

a. R Squared = .998 (Adjusted R Squared = .997)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

baking_loss

Duncan[a,b]

persen_CPO	N	Subset 1	2	3	4
50%	18	6.91111			
40%	18		7.13250		
30%	18			7.27506	
0%	18				7.46817
Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .008.

a. Uses Harmonic Mean Sample Size = 18.000.

b. Alpha = .05.

waktu_oven
Homogeneous Subsets

baking_loss

Duncan [a,b]

waktu_oven	N	Subset 1	2	3
15 mnt	24	5.60833		
18 mnt	24		6.30642	
20 mnt	24			9.67538
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .008.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Uji Warna secara Fisik untuk Variabel *lightness*

Tests of Between-Subjects Effects

Dependent Variable: lightness

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2482.771[a]	6	413.795	98.635	.000
Intercept	493445.139	1	493445.139	117621.2	.000
persen_CPO	53.107	3	17.702	4.220	.008
waktu_oven	2429.664	3	809.888	193.051	.000
Error	373.373	89	4.195		
Total	496301.283	96			
Corrected Total	2856.144	95			

a. R Squared = .869 (Adjusted R Squared = .860)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

lightness

Duncan[a,b]

persen_CPO	N	Subset 1	Subset 2
30%	24	70.79500	
40%	24	71.26083	
50%	24	71.95500	71.95500
0%	24		72.76583
Sig.		.066	.174

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 4.195.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

waktu_oven
Homogeneous Subsets

lightness

Duncan[a,b]

waktu_oven	N	Subset 1	Subset 2	Subset 3
0 mnt	24	63.03708		
20 mnt	24		73.65500	
18 mnt	24			74.92792
15 mnt	24			75.15667
Sig.		1.000	1.000	.700

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 4.195.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Uji Warna secara Fisik untuk Variabel a (tingkat kemerahan)

Tests of Between-Subjects Effects

Dependent Variable: a

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	76.037[a]	6	12.673	25.722	.000
Intercept	1610.236	1	1610.236	3268.279	.000
waktu_oven	26.727	3	8.909	18.082	.000
persen_CPO	49.310	3	16.437	33.361	.000
Error	43.849	89	.493		
Total	1730.122	96			
Corrected Total	119.886	95			

a. R Squared = .634 (Adjusted R Squared = .610)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

a

Duncan[a,b]

persen_CPO	N	Subset 1	Subset 2	Subset 3
0%	24	3.08208		
30%	24		3.76250	
40%	24			4.69750
50%	24			4.84000
Sig.		1.000	1.000	.484

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .493.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

waktu_oven
Homogeneous Subsets

a

Duncan[a,b]

waktu_oven	N	Subset 1	Subset 2	Subset 3
15 mnt	24	3.55083		
0 mnt	24	3.80667	3.80667	
18 mnt	24		4.07292	
20 mnt	24			4.95167
Sig.		.210	.192	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = .493.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Uji Warna secara Fisik untuk Variabel b (tingkat kekuningan)

Tests of Between-Subjects Effects

Dependent Variable: b

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3958.185[a]	6	659.697	116.731	.000
Intercept	107368.484	1	107368.484	18998.412	.000
persen_CPO	2268.295	3	756.098	133.788	.000
waktu_oven	1689.890	3	563.297	99.673	.000
Error	502.979	89	5.651		
Total	111829.647	96			
Corrected Total	4461.163	95			

a. R Squared = .887 (Adjusted R Squared = .880)

Post Hoc Tests
persen_CPO
Homogeneous Subsets

b

Duncan [a,b]

persen_CPO	N	Subset 1	Subset 2	Subset 3
0%	24	25.61917		
30%	24		33.14958	
40%	24			37.13042
50%	24			37.87208
Sig.		1.000	1.000	.283

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 5.651.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

waktu_oven
Homogeneous Subsets

b

Duncan [a,b]

waktu_oven	N	Subset 1	Subset 2	Subset 3
15 mnt	24	29.89583		
20 mnt	24		31.27667	
18 mnt	24		32.00875	
0 mnt	24			40.59000
Sig.		1.000	.289	1.000

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 5.651.

a. Uses Harmonic Mean Sample Size = 24.000.

b. Alpha = .05.

Uji Friedman Variabel Warna

Ranks

	Mean Rank
kontrol	1.87
tigapuluh.persen	2.90
empatpuluh.persen	2.47
limapuluh.persen	2.77

Test Statistics[a]

N	30
Chi-Square	11.400
df	3
Asymp. Sig.	.010

a. Friedman Test

Uji Friedman Variabel Rasa

Ranks

	Mean Rank
kontrol	2.67
tigapuluh.persen	2.37
empatpuluh.persen	2.47
limapuluh.persen	2.50

Test Statistics[a]

N	30
Chi-Square	.840
df	3
Asymp. Sig.	.840

a. Friedman Test

Uji Friedman Variabel Aroma

Ranks

	Mean Rank
kontrol	2.80
tigapuluh.persen	2.37
empatpuluh.persen	2.23
limapuluh.persen	2.60

Test Statistics[a]

N	30
Chi-Square	3.400
df	3
Asymp. Sig.	.334

a. Friedman Test

Uji Friedman Variabel Tekstur

Ranks

	Mean Rank
kontrol	2.57
tigapuluh.persen	2.37
empatpuluh.persen	2.33
limapuluh.persen	2.73

Test Statistics[a]

N	30
Chi-Square	1.880
df	3
Asymp. Sig.	.598

a. Friedman Test

Uji Friedman Variabel *Overall*

Ranks

	Mean Rank
kontrol	2.80
tigapuluh.persen	1.97
empatpuluh.persen	2.47
limapuluh.persen	2.77

Test Statistics[a]

N	30
Chi-Square	8.040
df	3
Asymp. Sig.	.045

a. Friedman Test

Lampiran 6. Analisa Uji LSD Tingkat Kesukaan Secara Sensoris

Uji LSD rank (manual) = $t_{\alpha/2}, \infty$ x $\sqrt{}$p x t x (t+1) : 6
Keterangan : $t_{\alpha/2}, \infty$ pada tingkat kepercayaan 95% adalah 1,960
p = jumlah panelis t = jumlah perlakuan

ANALISA UJI LSD *COOKIES* substitusi CPO untuk variabel WARNA
Uji LSD rank (manual)= 1,960 x $\sqrt{}$ 30 x 4 x 5 : 6 = 19,60
Nilai LSD rank = 19,60
RA = CPO 0% = 56
RB = CPO 30% = 87
RC = CPO 40% = 74
RD = CPO 50% = 83

RB – RA = 31, > LSD rank → A ≠ B, *cookies* 0% CPO ≠ *cookies* 30% CPO
RB – RC = 13, < LSD rank → B = C, *cookies* 30% CPO = *cookies* 40% CPO
RB – RD = 4 , < LSD rank → B = D, *cookies* 30% CPO = *cookies* 50% CPO
RC – RA = 18, < LSD rank → A = C, *cookies* 0% CPO = *cookies* 40% CPO
RD – RA = 27, > LSD rank → A ≠ D, *cookies* 0% CPO ≠ *cookies* 50% CPO
RD – RC = 9 , < LSD rank → C = D, *cookies* 40% CPO = *cookies* 50% CPO
A C B D
——— ———

ANALISA UJI LSD *COOKIES* substitusi CPO untuk variabel *OVERALL*
Uji LSD rank (manual)= 1,960 x $\sqrt{}$ 30 x 4 x 5 : 6 = 19,60
Nilai LSD rank = 19,60
RA = CPO 0% = 84
RB = CPO 30% = 59
RC = CPO 40% = 74
RD = CPO 50% = 83

RA – RB = 25, > LSD rank → A ≠ B, *cookies* 0% CPO ≠ *cookies* 30% CPO
RA – RC = 10, < LSD rank → A = C, *cookies* 0% CPO = *cookies* 40% CPO
RA – RD = 1 , < LSD rank → A = D, *cookies* 0% CPO = *cookies* 50% CPO
RC – RB = 15, < LSD rank → B = C, *cookies* 30% CPO = *cookies* 40% CPO
RD – RB = 24, > LSD rank → B ≠ D, *cookies* 30% CPO ≠ *cookies* 50% CPO
RD – RC = 9 , < LSD rank → C = D, *cookies* 40% CPO = *cookies* 50% CPO

A D C B
——— ———