

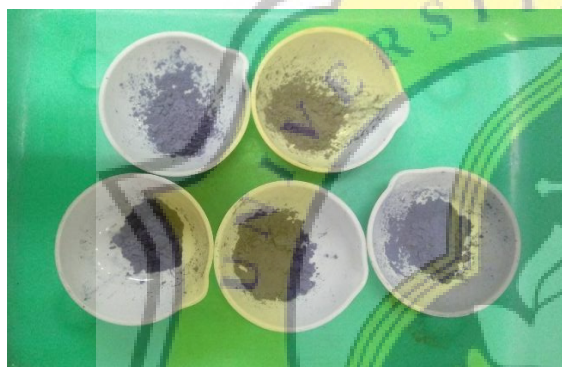
## 7. LAMPIRAN

### Lampiran 1. Foto

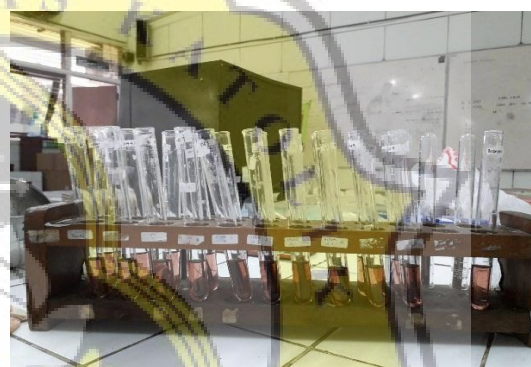
#### 1. Serbuk Pewarna Alami Bunga Telang



Gambar 16. Pembuatan Serbuk Pewarna



Gambar 17. Analisa Kadar Air Serbuk



Gambar 18. Analisa Aktivitas Antioksidan



Gambar 19. Analisa Total Antosianin



Gambar 20. Analisa Intensitas Warna

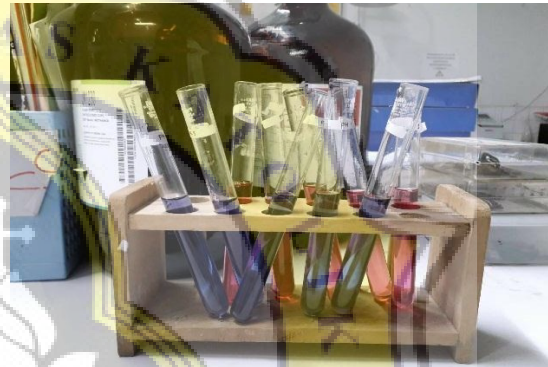
## 2. *Hard Candy*



Gambar 21. Pembuatan *Hard Candy*



Gambar 22. Analisa Aktivitas Antioksidan



Gambar 23. Analisa Total Antosianin



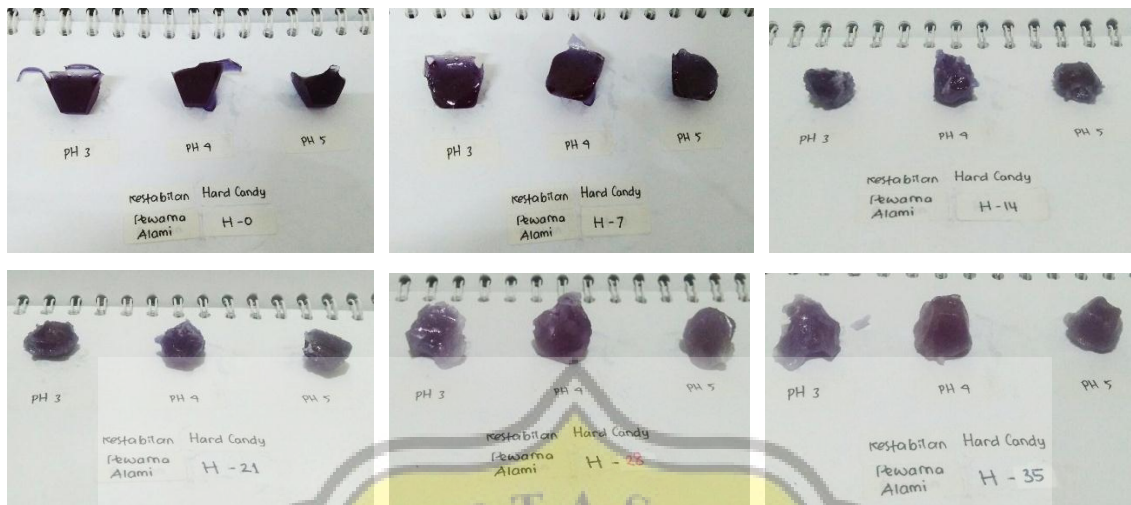
Gambar 24. Analisa Sensori Produk



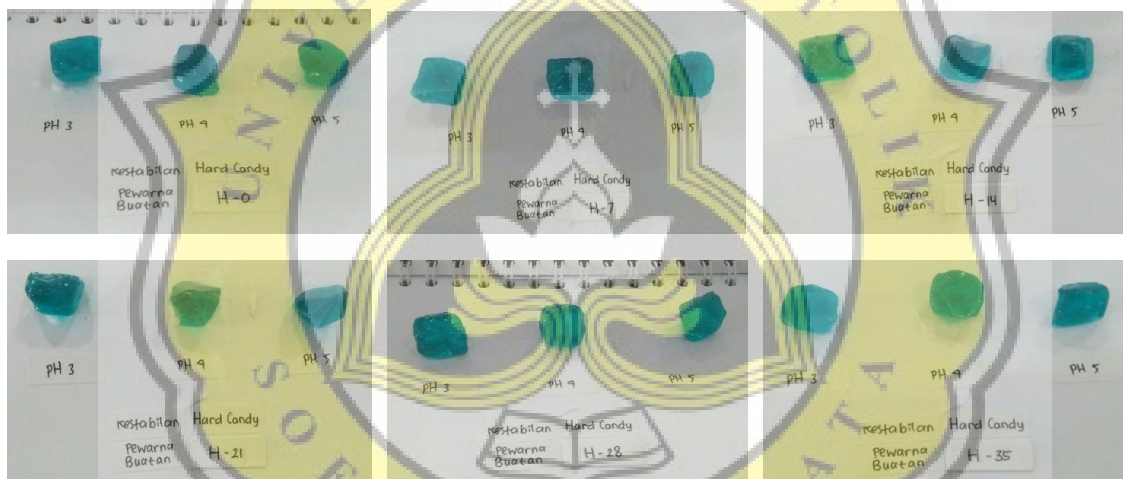
Gambar 25. Analisa Intensitas Warna



### 3. Perubahan Warna Produk *Hard Candy* Selama Penyimpanan



Gambar 26. Perubahan Warna pada *Hard Candy* dengan Pewarna Alami Selama 35 Hari Penyimpanan



Gambar 27. Perubahan Warna pada *Hard Candy* dengan Pewarna Sintetik Selama 35 Hari Penyimpanan

## Lampiran 2. Kuisisioner Analisa Sensori

### UJI RATING HEDONIK

Nama Panelis : Tanggal : ..... Agustus 2019

Jenis Kelamin : Produk : *Hard Candy*

#### Instruksi :

Di depan ada telah disediakan 4 sampel *Hard Candy*. Amati warna dari semua sampel tersebut kemudian cicipi rasa dari tiap sampelnya. Sensori produk dilakukan secara berurutan dari kiri ke kanan. Setelah mengamati semua sampel, anda boleh mengulang sesering mungkin sesuai yang anda perlukan. Berilah penilaian pada setiap sampel dan score yang diberikan **BOLEH SAMA ANTAR SAMPEL**, dari skala 1-4 dengan keterangan sebagai berikut :

#### Keterangan :

1 = sangat tidak suka      3 = suka  
2 = tidak suka              4 = sangat suka

Kode Sampel	Score Warna	Score Rasa	Overall

### Lampiran 3. Hasil Pengolahan Data dengan SPSS

#### 1. Produk *Hard Candy*

##### Uji Normalitas

**Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
warna_permen_L	.088	40	.200*	.973	40	.444
warna_permen_a	.080	40	.200*	.970	40	.361
warna_permen_b	.093	40	.200*	.939	40	.032
antioksidan	.129	40	.092	.922	40	.009
antosianin	.120	40	.147	.968	40	.303

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

a. Lilliefors Significance Correction

##### Uji Homogenitas

**Test of Homogeneity of Variance**

		Levene Statistic	df1	df2	Sig.
warna_permen_L	Based on Mean	3.506	3	36	.025
	Based on Median	2.961	3	36	.045
	Based on Median and with adjusted df	2.961	3	16.728	.062
	Based on trimmed mean	3.487	3	36	.025
warna_permen_a	Based on Mean	5.416	3	36	.004
	Based on Median	2.522	3	36	.073
	Based on Median and with adjusted df	2.522	3	11.122	.111
	Based on trimmed mean	4.431	3	36	.009
warna_permen_b	Based on Mean	.992	3	36	.408
	Based on Median	.875	3	36	.463
	Based on Median and with adjusted df	.875	3	33.436	.464
	Based on trimmed mean	.990	3	36	.408
antioksidan	Based on Mean	1.121	3	36	.354
	Based on Median	1.025	3	36	.393
	Based on Median and with adjusted df	1.025	3	30.804	.395
	Based on trimmed mean	1.052	3	36	.381
antosianin	Based on Mean	1.857	3	36	.154
	Based on Median	1.656	3	36	.194
	Based on Median and with adjusted df	1.656	3	31.570	.196
	Based on trimmed mean	1.797	3	36	.165

## Uji One Way Anova

### Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
warna_permen_b	.992	3	36	.408
antioksidan	1.121	3	36	.354
antosianin	1.857	3	36	.154

### Tabel Post Hoc

#### warna\_permen\_b

Duncan<sup>a</sup>

pH	N	Subset for alpha = 0.05			
		1	2	3	4
pH 6	10	-8.7640			
pH 5	10		-7.4390		
pH 4	10			-6.0630	
pH 3	10				-4.7170
Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10,000.

#### antioksidan

Duncan<sup>a</sup>

pH	N	Subset for alpha = 0.05		
		1	2	3
pH 6	10	8.1998		
pH 3	10		9.7188	
pH 5	10		9.8442	
pH 4	10			10.4839
Sig.		1.000	.680	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10,000.

#### antosianin

Duncan<sup>a</sup>

pH	N	Subset for alpha = 0.05	
		1	2
pH 6	10	.8283	
pH 5	10		1.7050
pH 3	10		1.9304
pH 4	10		2.1041
Sig.		1.000	.058

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10,000.

## 2. Hard Candy Selama Penyimpanan

### PERMEN pH 3

#### Uji Normalitas

Tests of Normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Antosianin	.102	60	.189	.954	60	.023
Warna_alami_L	.105	60	.095	.951	60	.017
Warna_alami_a	.104	60	.164	.946	60	.010
Warna_alami_b	.112	60	.059	.957	60	.035
Warna_buatan_L	.084	60	.200*	.983	60	.579
Warna_buatan_a	.113	60	.054	.941	60	.006
Warna_buatan_b	.109	60	.076	.943	60	.008

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

a. Lilliefors Significance Correction

#### Uji Homogenitas

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Antosianin	Based on Mean	3.743	5	54	.006
	Based on Median	3.288	5	54	.012
	Based on Median and with adjusted df	3.288	5	49.164	.012
	Based on trimmed mean	3.734	5	54	.006
Warna_alami_L	Based on Mean	11.822	5	54	.000
	Based on Median	2.640	5	54	.033
	Based on Median and with adjusted df	2.640	5	26.432	.046
	Based on trimmed mean	10.804	5	54	.000
Warna_alami_a	Based on Mean	7.068	5	54	.000
	Based on Median	5.091	5	54	.001
	Based on Median and with adjusted df	5.091	5	39.295	.001
	Based on trimmed mean	6.759	5	54	.000
Warna_alami_b	Based on Mean	11.035	5	54	.000
	Based on Median	3.852	5	54	.005
	Based on Median and with adjusted df	3.852	5	22.007	.012
	Based on trimmed mean	9.741	5	54	.000
Warna_buatan_L	Based on Mean	2.800	5	54	.026
	Based on Median	2.665	5	54	.032
	Based on Median and with adjusted df	2.665	5	49.780	.033
	Based on trimmed mean	2.823	5	54	.025
Warna_buatan_a	Based on Mean	6.223	5	54	.000
	Based on Median	4.562	5	54	.002
	Based on Median and with adjusted df	4.562	5	38.341	.002
	Based on trimmed mean	6.139	5	54	.000
Warna_buatan_b	Based on Mean	4.189	5	54	.003
	Based on Median	3.685	5	54	.006
	Based on Median and with adjusted df	3.685	5	25.194	.012
	Based on trimmed mean	4.354	5	54	.002



## PERMEN pH 4

### Uji Normalitas

**Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Antosianin	.107	60	.085	.942	60	.007
Warna_alami_L	.114	60	.052	.937	60	.004
Warna_alami_a	.113	60	.053	.964	60	.071
Warna_alami_b	.100	60	.200*	.967	60	.105
Warna_buatan_L	.077	60	.200*	.975	60	.251
Warna_buatan_a	.094	60	.200*	.977	60	.303
Warna_buatan_b	.094	60	.200*	.966	60	.097

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

a. Lilliefors Significance Correction

### Uji Homogenitas

**Test of Homogeneity of Variance**

		Levene Statistic	df1	df2	Sig.
Antosianin	Based on Mean	2.950	5	54	.020
	Based on Median	2.440	5	54	.046
	Based on Median and with adjusted df	2.440	5	32.130	.055
	Based on trimmed mean	2.747	5	54	.028
Warna_alami_L	Based on Mean	3.018	5	54	.018
	Based on Median	2.148	5	54	.074
	Based on Median and with adjusted df	2.148	5	43.358	.078
	Based on trimmed mean	2.896	5	54	.022
Warna_alami_a	Based on Mean	7.528	5	54	.000
	Based on Median	4.507	5	54	.002
	Based on Median and with adjusted df	4.507	5	37.349	.003
	Based on trimmed mean	7.484	5	54	.000
Warna_alami_b	Based on Mean	15.672	5	54	.000
	Based on Median	8.491	5	54	.000
	Based on Median and with adjusted df	8.491	5	29.347	.000
	Based on trimmed mean	15.582	5	54	.000
Warna_buatan_L	Based on Mean	1.983	5	54	.096
	Based on Median	1.535	5	54	.195
	Based on Median and with adjusted df	1.535	5	36.846	.203
	Based on trimmed mean	2.004	5	54	.093
Warna_buatan_a	Based on Mean	22.338	5	54	.000
	Based on Median	12.533	5	54	.000
	Based on Median and with adjusted df	12.533	5	27.412	.000
	Based on trimmed mean	22.292	5	54	.000
Warna_buatan_b	Based on Mean	79.457	5	54	.000
	Based on Median	4.080	5	54	.003
	Based on Median and with adjusted df	4.080	5	10.269	.027
	Based on trimmed mean	69.303	5	54	.000



## Uji One Way Anova

### ANOVA

Warna\_buatan\_L

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.340	5	1.668	5.936	.000
Within Groups	15.174	54	.281		
Total	23.514	59			

## Tabel Post Hoc

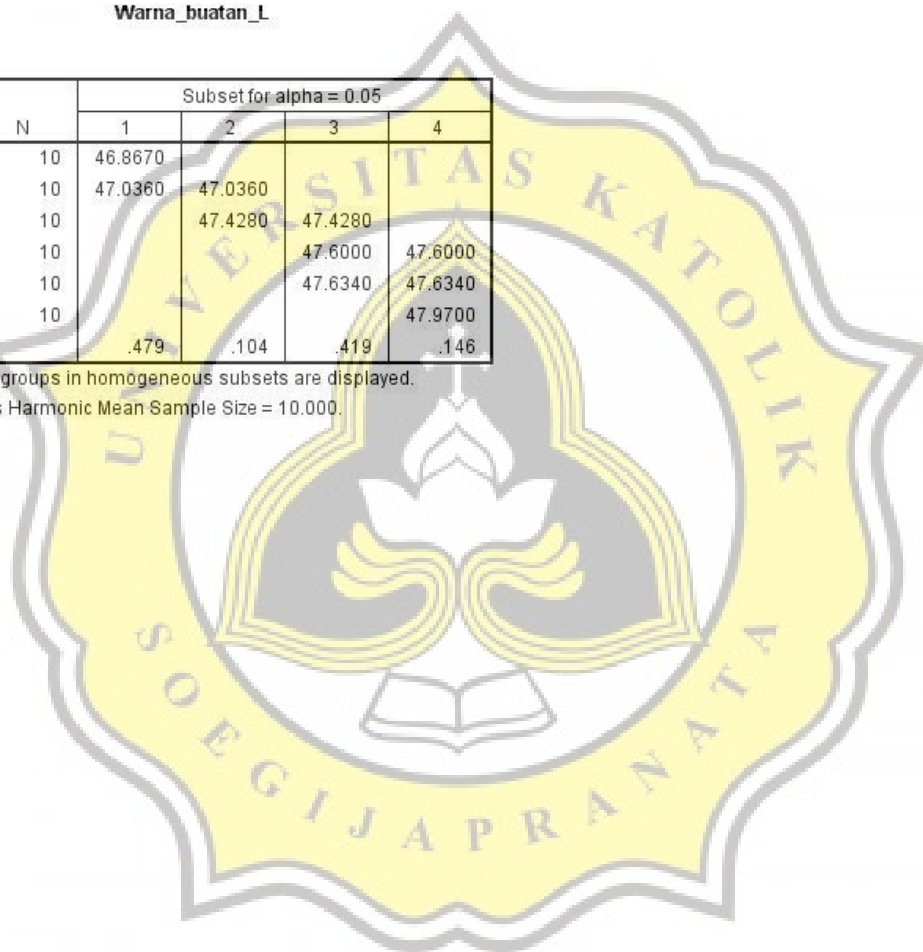
Warna\_buatan\_L

Duncan<sup>a</sup>

Hari	N	Subset for alpha = 0.05			
		1	2	3	4
H-21	10	46.8670			
H-7	10	47.0360	47.0360		
H-28	10		47.4280	47.4280	
H-35	10			47.6000	47.6000
H-0	10			47.6340	47.6340
H-14	10				47.9700
Sig.		.479	.104	.419	.146

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10.000.



**PERMEN pH 5****Uji Normalitas****Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Antosianin	.109	60	.072	.942	60	.006
Warna_alami_L	.095	60	.200*	.946	60	.010
Warna_alami_a	.096	60	.200*	.958	60	.037
Warna_alami_b	.090	60	.200*	.964	60	.073
Warna_buatan_L	.104	60	.165	.968	60	.115
Warna_buatan_a	.100	60	.200*	.942	60	.007
Warna_buatan_b	.105	60	.100	.958	60	.039

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

a. Lilliefors Significance Correction

**Uji Homogenitas****Test of Homogeneity of Variance**

		Levene Statistic	df1	df2	Sig.
Antosianin	Based on Mean	4.556	5	54	.002
	Based on Median	3.721	5	54	.006
	Based on Median and with adjusted df	3.721	5	28.361	.010
	Based on trimmed mean	4.552	5	54	.002
Warna_alami_L	Based on Mean	8.749	5	54	.000
	Based on Median	2.335	5	54	.054
	Based on Median and with adjusted df	2.335	5	19.723	.080
	Based on trimmed mean	8.201	5	54	.000
Warna_alami_a	Based on Mean	4.783	5	54	.001
	Based on Median	2.402	5	54	.049
	Based on Median and with adjusted df	2.402	5	29.600	.061
	Based on trimmed mean	4.515	5	54	.002
Warna_alami_b	Based on Mean	7.897	5	54	.000
	Based on Median	7.474	5	54	.000
	Based on Median and with adjusted df	7.474	5	30.766	.000
	Based on trimmed mean	7.866	5	54	.000
Warna_buatan_L	Based on Mean	14.294	5	54	.000
	Based on Median	10.615	5	54	.000
	Based on Median and with adjusted df	10.615	5	38.463	.000
	Based on trimmed mean	14.322	5	54	.000
Warna_buatan_a	Based on Mean	1.328	5	54	.266
	Based on Median	1.127	5	54	.357
	Based on Median and with adjusted df	1.127	5	36.049	.364
	Based on trimmed mean	1.286	5	54	.283
Warna_buatan_b	Based on Mean	24.217	5	54	.000
	Based on Median	22.176	5	54	.000
	Based on Median and with adjusted df	22.176	5	18.363	.000
	Based on trimmed mean	23.959	5	54	.000

## Uji One Way Anova

### ANOVA

Warna\_buatan\_a

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.302	5	2.460	4.601	.001
Within Groups	28.878	54	.535		
Total	41.180	59			

## Tabel Post Hoc

Warna\_buatan\_a

Duncan<sup>a</sup>

Hari	N	Subset for alpha = 0.05		
		1	2	3
H-21	10	-17.5800		
H-28	10	-17.4370	-17.4370	
H-35	10	-17.4040	-17.4040	
H-7	10	-17.3820	-17.3820	
H-14	10		-16.8030	-16.8030
H-0	10			-16.2990
Sig.		.588	.081	.129

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10.000.

## 3. Analisa Sensori

### Uji Sensori (Kruskal Wallis)

Test Statistics<sup>a,b</sup>

	Warna	Rasa	Overall
Chi-Square	3.858	8.980	10.614
df	3	3	3
Asymp. Sig.	.277	.030	.014

a. Kruskal Wallis Test

b. Grouping Variable: pH

### Uji Sensori (Mann Whitney)

### Uji Mann Whitney (pH 3 vs pH 4)

Test Statistics<sup>a</sup>

	Rasa	Overall
Mann-Whitney U	418.500	407.500
Wilcoxon W	883.500	872.500
Z	-.517	-.684
Asymp. Sig. (2-tailed)	.605	.494

a. Grouping Variable: pH

### Uji Mann Whitney (pH 3 vs pH 5)

Test Statistics<sup>a</sup>

	Rasa	Overall
Mann-Whitney U	331.000	281.500
Wilcoxon W	796.000	746.500
Z	-1.958	-2.799
Asymp. Sig. (2-tailed)	.050	.005

a. Grouping Variable: pH

### Uji Mann Whitney (pH 3 vs pH 6)

Test Statistics<sup>a</sup>

	Rasa	Overall
Mann-Whitney U	358.500	282.000
Wilcoxon W	823.500	747.000
Z	-1.466	-2.693
Asymp. Sig. (2-tailed)	.143	.007

a. Grouping Variable: pH

### Uji Mann Whitney (pH 4 vs pH 5)

Test Statistics<sup>a</sup>

	Rasa	Overall
Mann-Whitney U	287.500	346.500
Wilcoxon W	752.500	811.500
Z	-2.741	-1.658
Asymp. Sig. (2-tailed)	.006	.097

a. Grouping Variable: pH

### Uji Mann Whitney (pH 4 vs pH 6)

Test Statistics<sup>a</sup>

	Rasa	Overall
Mann-Whitney U	322.500	337.000
Wilcoxon W	787.500	802.000
Z	-2.085	-1.772
Asymp. Sig. (2-tailed)	.037	.076

a. Grouping Variable: pH

### Uji Mann Whitney (pH 5 vs 6)

Test Statistics<sup>a</sup>

	Rasa	Overall
Mann-Whitney U	432.500	427.000
Wilcoxon W	897.500	892.000
Z	-.290	-.377
Asymp. Sig. (2-tailed)	.772	.706

a. Grouping Variable: pH





**7.87%** PLAGIARISM  
APPROXIMATELY

## Report #9654210

PENDAHULUAN Latar Belakang Warna merupakan sebuah estetika yang penting dalam penampilan sebuah produk pangan. Selain memberi kesan menarik bagi konsumen, zat pewarna memiliki fungsi untuk menutupi perubahan warna yang mungkin terjadi akibat proses pengolahan dan penyimpanan. Pewarna makanan terbagi menjadi tiga jenis, yaitu pewarna alami, pewarna identik alami, dan pewarna sintesis/buatan (Mudjajanto, 2006 dalam Andini et al., 2017). Pada penelitian ini, ekstrak biopigmen biru antosianin dari bunga telang (*Clitoria ternatea* L.) akan diaplikasikan sebagai pewarna alami hard candy. Bunga telang merupakan salah satu tumbuhan yang memiliki bunga majemuk, yang mempunyai kelopak bunga berbentuk corong, mahkota berbentuk kupu-kupu, dan berwarna biru (Hartono et al., 2013 dalam Alfania, 2018). Bunga telang berfungsi sebagai pewarna alami karena pada mahkota bunga telang tersebut mengandung pigmen biru antosianin (Kazuma, 2003 dalam Mastuti, 2013). Antosianin dapat memberikan warna yang berbeda-beda tergantung pada pHnya. Pada kondisi pH asam, antosianin berwarna merah atau ungu, pada kondisi pH netral, antosianin berwarna biru, sedangkan pada kondisi pH basa, antosianin berwarna hijau atau kuning (Mahmudatussa'adah, 2015). Antosianin juga cenderung lebih stabil dalam kondisi pH asam dibanding pH netral atau basa. Di