BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

Berdasarkan penelitian yang telah dilakukan dapat disimpulkan:

1. Ekstrak daun ubi jalar *(Ipomoea batatas L.)* dengan variasi *gelling agent* CMC Na dan Carbopol 941 dapat dibuat menjadi sediaan gel yang memenuhi mutu fisik.
2. Formula 2 (CMC Na 0% : Carbopol 941 2%) berdasarkan hasil penelitian mempunyai stabilitas dan uji mutu fisik yang terbaik dari tiga formula gel yang telah dibuat. Hasil diperkuat dengan analisis secara *One Way* Anova yang menunjukkan bahwa ada perbedaan yang signifikan antara formula 1, formula 2 dan formula 3.

B. Saran

Saran yang didapat dari hasil penelitian gel ekstrak daun ubi jalar adalah:

1. Perlu dilakukan penelitian lebih lanjut tentang pembuatan gel ekstrak daun ubi jalar dengan variasi *gelling agent* yang berbeda, untuk mendapatkan gel dengan mutu fisik yang baik.
2. Perlu dilakukan uji farmakologinya untuk mengetahui efektifitas sediaan gel ekstrak daun ubi jalar.

DAFTAR PUSTAKA

Allen, L.. 1998. *The Art, Science, and Technology of Pharmaceutical Compounding.* Washington. D. C.: American Pharmaceutical Assosiation. Hlm 201-213.

Anonim. 1978. *Formularium Nasional.* Edisi Kedua. Departemen Kesehatan Republik Indonesia.

Anonim. 1979. *Farmakope Indonesia, Edisi III*. Jakarta: Departemen Kesehatan Republik Indonesia.

Anonim. 1980. *Materia Medika Indonesia*. Jilid IV. Jakarta: Departemen Kesehatan Republik Indonesia. Hlm 170 – 171.

Anonim. 1986. *Sediaan Galenik.* Jakarta: Direktorat Jendral Pengawasan Obat Dan Makanan, Departemen Kesehatan Republik Indonesia.

Anonim. 1989. *Materia Medika Indonesia*. Jilid V. Jakarta: Departemen Kesehatan Republik Indonesia. Hlm 87-91.

Anonim. 1995. *Farmakope Indonesia*. Edisi IV. Jakarta : Departemen Kesehatan Republik Indonesia.

Anonim. 2001. *Inventaris Tanaman Obat Indonesia (I) Jilid 2.* Jakarta: Departemen Kesehatan & Kesejahteraan Sosial RI Badan Penelitian Dan Pengembangan Kesehatan. Hlm 175-176.

Ansel, C.H.. 1989. *Pengantar Bentuk Sediaan Farmasi,* Edisi IV. Jakarta: Universitas Indonesia Press. Hlm 489-497.

Grace P.A, Borley N.R. 2006. At a Glace Ilmu Bedah. Edisi ke-3. Jakarta: Erlangga Medical Series Hlm: 87.

Harbone J.B. 1987. *Metode Fitokimia*. Diterjemahkan oleh Padmawi; Bandung: Institut Tekhnologi Bandung. Hlm 71, 102.

Harbone J.B. 1996. *Metode Fitokimia Penuntun. Cara Modern Menganalisa Tumbuhan.* Cetakan II. Bandung: ITB Bandung, 47.

Lachaman, L. *et al*., 1986. *The Theory And Practice Of Industrial Pharmacy.* Philadelphia: Lea & Febiger.

Lachman, L. *et al*., 1994. *Teori dan Praktek Farmasi Industri, Edisi III.* Terjemahan oleh Siti Suyatmi. 1994. Jakarta: Indonesia University Press. Hlm 1091-1093.

Martin, A., Swarbick, J., Commarata, A. 1993. Farmasi Fisik II. Edisi Ketiga. Jakarta: Universitas Indonesia Press. Hlm 335, 545-546, 1034-1037.

Rahim F, Aria M, Aji NP. 2011. *Formulasi Krim Etanol Daun Ubi Jalar (Ipomoeae batatas L.) Untuk Pengobatan Luka BAkar.* http://www.stifi padang.ac.id/documents/jurnal_feb2011/JURNAL%20SCIENTIA%20FE BRUARI%202011.pdf (18 September 2014).

Rowe R., Sheskey P., Waller P. 2006. *Handbook of Pharmaceutical Excipients.* Edisi keempat. Washington DC: Pharmaceutical Press and American Pharmacist Association. Hlm 120-123, 301-303, 630-631, 466-467, 794.

Rukmana. 1997. *Ubi Jalar: Budi daya dan pascapanen.* Yogyakarta: Kanisius.

Sulaiman, T.N.S. dan Rina Kuswahyuning. 2008. *Teknologi dan Formulasi Sediaan Semi P adat.* Yogyakarta: Pustaka Laboratorium Teknologi Farmasi Fakultas Farmasi Universitas Gajah mada.

Thomas A.N.S. 1989. *Tanaman Obat Tradisonal.* Yogyakarta: Kanisius. Hlm 11.

Voigt, R. 1994. *Buku Pelajaran Teknologi Farmasi*, Edisi V. Yogyakarta: Gadjah Mada University Press.

Voigt, R. 1995. *Buku Pelajaran Teknologi Farmasi*, Edisi V. Yogyakarta: Gadjah Mada University Press.

Warsitaatmaja. 1997. *Penuntun Umum Kosmetika Medik*. Jakarta: Universitas Indonesia Press. Hlm 23.

Widodo H. 2013. *Ilmu Meracik Obat Untuk Apoteker.* Yogyakarta: D-Medika. Hlm 197-198.

Lampiran 1. Hasil determinasi daun ubi jalar *(Ipomoea batatas L.)*

UNIVERSITAS SETIA BUDI

UPT- LABORATORIUM

No : 187/DET/UPT-LAB/16/X/2014
Hal : Surat Keterangan Determinasi Tumbuhan

Menerangkan bahwa :
Nama : Della Maitaningsih
NIM : 15120913 B
Fakultas : Farmasi Universitas Setia Budi

Telah mendeterminasikan tumbuhan : **Ketela rambat / *Ipomoea batatas* Lamk.**

Hasil determinasi berdasarkan : Steenis : FLORA

1b – 2b – 3b – 4b – 6b – 7b – 9b – 10b – 11b – 12b – 13b – 14a – 15a. Golongan 8. 109b – 119b – 120a – 121a – 122b – 123b. 107. Familia Convolvulaceae. 1b. Ipomoea. 1b – 2b – 3b – 4b – 5b – 6b. ***Ipomoea batatas* Lamk.**

Deskripsi :

Habitus : Semak bercabang.

Batang : Bulat, bergetah, berambut, hijau, membentuk umbi.

Daun : Tunggal, bulat telur, berbagi menjari 5 dalam, tangkai daun panjang, herbaceus, hijau.

Bunga : Karangan bunga di ketiak, bentuk payung. Daun pelindung kecil, rontok. Daun kelopak memanjang bulat telur, runcing, yang terluar paling kecil. Mahkota bentuk lonceng sampai bentuk terompet, ungu muda. Benangsari tertanam dalam, tidak sama panjangnya. Tangkai putik bentuk benang. Kepala putik bentuk bola rangkap. Tonjolan dasar bunga bentuk cawan.

Akar : Tunggang.

Pustaka : Steenis C.G.G.J., Bloembergen S. Eyma P.J. (1978): *FLORA*, PT Pradnya Paramita. Jl. Kebon Sirih 46. Jakarta Pusat, 1978.

Surakarta, 16 Oktober 2014
Tim determinasi

Dra. Kartinah Wiryosoendjojo, SU.

Jl. Let.jen Sutoyo, Mojosongo-Solo 57127 Telp.0271-852518, Fax.0271-853275
Homepage : www.setiabudi.ac.id, e-mail : info@setiabudi.ac.id

Lampiran 2. Hasil rendemen daun ubi jalar *(Ipomoea batatas L)* kering

- Rendemen daun ubi jalar kering

Serbuk daun ubi jalar di dapat dari daun ubi jalar kering sebanyak 1200 gram, dihaluskan dan di ayak dan bobotnya menjadi 400 gram, rendemen yang didapatkan adalah:

$$\text{Rendemen} = \frac{\text{bobot serbuk (g)}}{\text{bobot kering (g)}} \text{ x } 100\%$$

$$= \frac{400}{1200} \text{ x } 100\%$$

$$= 33{,}33\%$$

Rendemen daun ubi jalar kering adalah 33,33%

Lampiran 3. Perhitungan susut pengeringan serbuk daun ubi jalar

No	Berat penimbangan (g)	Susut pengeringan (%)
1	2g	7,5
2	2g	7,3
3	2g	7,1
Rata-rata		7,3

Rata-rata susut pengeringan : $\frac{7,5+7,3+7,1}{3}$

= 7,3%

Lampiran 4. Hasil rendemen ekstrak daun ubi jalar

Rendemen $= \frac{Berat\ ekstrak}{Berat\ Serbuk} x\ 100\%$

$= \frac{59,8}{400}$ x 100%

Rendemen ekstrak daun ubi jalar aadlah 14,9 %

Lampiran 5. Perhitungan Formula

1. Perhitungan Formula 1

-Ekstrak daun ubi jalar : $\frac{3}{100}$ x 100 g = 3 g

-CMC Na : $\frac{2}{100}$ x100 g = 2g

-Carbopol 941 : -

-Gliserin : $\frac{1}{100}$ x 100 g = 1g

-TEA : $\frac{0,5}{100}$ x 100 g = 0,5g

-Nipagin :$\frac{0,025}{100}$ x 100 g = 0,025 g

-Nipasol :$\frac{0,015}{100}$ x 100 g = 0,015 g

-Aquadest :$\frac{100}{100}$x100g=100g– (3+2+1+0,5+0,025+0,015)

= 100 g-6,54g = 93,46 gram

2. Perhitungan Formula 2

-Ekstrak daun ubi jalar :$\frac{3}{100}$x100g =3g

-CMC Na :-

-Carbopol 941 :$\frac{2}{100}$x100g =2g

-Gliserin :$\frac{1}{100}$x100g =1g

-TEA :$\frac{0,5}{100}$x100g =0,5g

-Nipagin :$\frac{0,025}{100}$x100g =0,025g

-Nipasol :$\frac{0,015}{100}$x 100g =0,015g

-Aquadest : $\frac{100}{100}$x100g=100g–

(3+2+1+0,5+0,025+0,015) = 100 g-6,54g = 93,46 gram

3. Perhitungan Formula 3

-Ekstrak daun ubi jalar : $\frac{3}{100}$ x 100 g = 3 g

-CMC Na : $\frac{1}{100}$ x100 g = 1g

-Carbopol 941 : $\frac{1}{100}$ x 100 g = 1g

-Gliserin : $\frac{1}{100}$ x 100 g = 1g

-TEA : $\frac{0,5}{100}$ x 100 g = 0,5g

-Nipagin :$\frac{0,025}{100}$ x 100 g = 0,025 g

-Nipasol :$\frac{0,015}{100}$ x 100 g = 0,015 g

-Aquadest :$\frac{100}{100}$x100g=100g–

(3+1+1+1+0,5+0,025+0,015) = 100 g-6,54g

= 93,46 gram

Lampiran 6. Data hasil uji daya sebar gel ekstrak daun ubi jalar

a. Data pengujian minggu 1

Formula	Beban (Gram)	Replikasi		
		1	2	3
F1	63,032	5.1	4.8	5
	113,032	5.5	5.7	5.6
	163,032	6	5.6	6
	213,032	6.4	6.3	6.5
F2	63,032	3	3	2.9
	113,032	3.6	3.4	3.3
	163,032	3.7	3.6	3.7
	213,032	4	3.8	3.9
F3	63,032	3.8	3.9	3.4
	113,032	4.5	4.1	4.2
	163,032	4.7	4.7	4.5
	213,032	5	5	4.8

b. Data pengujian minggu ke 2

Formula	Beban (Gram)	Replikasi		
		1	2	3
F1	63,032	4.7	4.8	5
	113,032	5.4	5.5	5.7
	163,032	6	5.8	6
	213,032	6.3	6.3	6.3
F2	63,032	2.8	2.7	3
	113,032	3.1	3,1	3.4
	163,032	4.3	3.4	3.6
	213,032	3.6	3.5	3.9
F3	63,032	3.8	3.9	3.6
	113,032	4.2	4.3	4.1
	163,032	4.5	4.5	4.5
	213,032	4.8	4.8	4.8

c. Data pengujian minggu ke 3

Formula	**Beban (Gram)**	**Replikasi**		
		1	**2**	**3**
F1	63,032	5.6	5.7	5.4
	113,032	6.3	6.5	6
	163,032	6.3	7	6.2
	213,032	6.5	7.1	6.7
F2	63,032	3.1	3	3.1
	113,032	3.5	3.5	3.6
	163,032	3.7	3.5	3.7
	213,032	3.9	3.7	4
F3	63,032	4.8	4.9	4.8
	113,032	5.3	5.4	5.1
	163,032	5.8	5.7	5.5
	213,032	6.1	6	5.9

d. Data pengujian minggu ke 4

Formula	Beban (Gram)	Replikasi		
		1	2	3
F1	63,032	5.3	5.4	5.6
	113,032	5.8	6	6.2
	163,032	6.5	6.5	6.4
	213,032	6.7	6.7	6.6
F2	63,032	3	3	2.9
	113,032	3.4	3.3	3.3
	163,032	3.6	3.5	3.7
	213,032	3.9	3.9	3.8
F3	63,032	4.8	4.9	5
	113,032	5.3	5.4	5.4
	163,032	5.6	5.7	5.7
	213,032	5.9	6	6

Lampiran 7. Data uji daya lekat gel ekstrak daun ubi jalar

a. Data pengujian minggu pertama

Replikasi	Daya lekat (detik)		
	F1	F2	F3
1	5.34	42.07	10.62
2	5.09	40.27	10.04
3	4.95	40.35	9.84

b. Data pengujian minggu kedua

Replikasi	Daya lekat (detik)		
	F1	F2	F3
1	4.48	40.86	13.31
2	4.9	40.1	7.58
3	5.63	40.9	9.87

c

c. Data pengujian minggu ketiga

Replikasi	Daya lekat (detik)		
	F1	F2	F3
1	4.46	40.6	7.26
2	4.08	38.05	6.97
3	3.8	41.28	8.77

d. Data pengujian minggu keempat

Replikasi	Daya lekat (detik)		
	F1	F2	F3
1	3.35	40.34	6.04
2	3.54	39.54	6.15
3	4.42	40.3	6.36

Lampiran 8. Foto daun ekstrak daun ubi jalar

Lampiran 9. Hasil uji identifikasi senyawa saponin, flavonoid, polifenol.

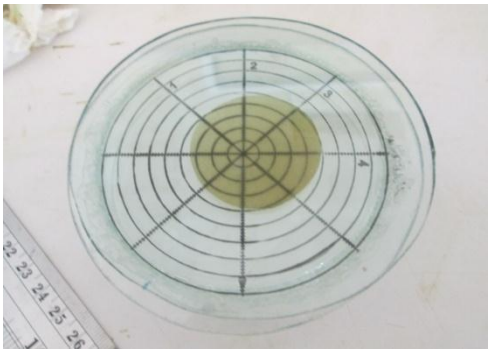
A. Flavonoid

C. Polifenol

B. Saponin

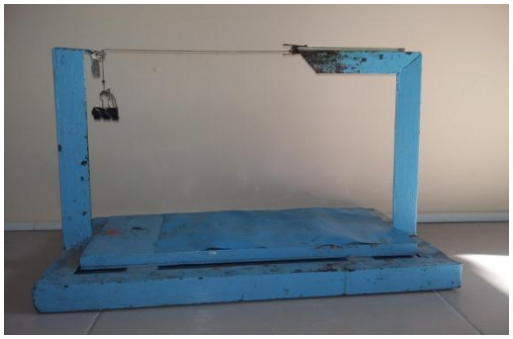
Lampiran 12. Foto alat pengujian gel ekstrak daun ubi jalar

Alat Penguji pH



Alat Penguji Daya Sebar

Alat Uji Viskositas



Alat Uji Daya Lekat

Lampiran 13. Gel ekstrak daun ubi jalar

Lampiran 14. Hasil analisis uji statistik

a. Daya Lekat Minggu 1

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Daya lekat	9	18.7300	16.77685	4.95	42.07

One-Sample Kolmogorov-Smirnov Test

		Daya lekat
N		9
Normal Parameters[a,b]	Mean	18.7300
	Std. Deviation	16.77685
Most Extreme Differences	Absolute	.352
	Positive	.352
	Negative	-.234
Kolmogorov-Smirnov Z		1.057
Asymp. Sig. (2-tailed)		.214

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

Daya lekat

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Formula 1	3	5.1267	.19757	.11407	4.6359	5.6175	4.95	5.34
Formula 2	3	40.8967	1.01692	.58712	38.3705	43.4228	40.27	42.07
Formula 3	3	10.1667	.40513	.23390	9.1603	11.1731	9.84	10.62
Total	9	18.7300	16.77685	5.59228	5.8342	31.6258	4.95	42.07

Test of Homogeneity of Variances

Daya lekat

Levene Statistic	df1	df2	Sig.
6.562	2	6	.031

ANOVA

Daya lekat

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2249.227	2	1124.614	2726.777	.000
Within Groups	2.475	6	.412		
Total	2251.702	8			

Post Hoc Tests

Multiple Comparisons

Daya lekat
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Formula 1	Formula 2	-35.77000*	.52436	.000	-37.3789	-34.1611
	Formula 3	-5.04000*	.52436	.000	-6.6489	-3.4311
Formula 2	Formula 1	35.77000*	.52436	.000	34.1611	37.3789
	Formula 3	30.73000*	.52436	.000	29.1211	32.3389
Formula 3	Formula 1	5.04000*	.52436	.000	3.4311	6.6489
	Formula 2	-30.73000*	.52436	.000	-32.3389	-29.1211

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Daya lekat

Tukey HSD[a]

Formula	N	Subset for alpha = 0.05		
		1	2	3
Formula 1	3	5.1267		
Formula 3	3		10.1667	
Formula 2	3			40.8967
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 3.000.

b. Daya Lekat Minggu 4

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Daya Lekat	9	16.6711	17.57672	3.35	40.34

One-Sample Kolmogorov-Smirnov Test

		Daya Lekat
N		9
Normal Parameters[a,b]	Mean	16.6711
	Std. Deviation	17.57672
Most Extreme Differences	Absolute	.388
	Positive	.388
	Negative	-.237
Kolmogorov-Smirnov Z		1.164
Asymp. Sig. (2-tailed)		.133

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

Daya Lekat

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Formula 1	3	3.7700	.57088	.32960	2.3519	5.1881	3.35	4.42
Formula 2	3	40.0600	.45078	.26026	38.9402	41.1798	39.54	40.34
Formula 3	3	6.1833	.16258	.09387	5.7795	6.5872	6.04	6.36
Total	9	16.6711	17.57672	5.85891	3.1605	30.1818	3.35	40.34

Test of Homogeneity of Variances

Daya Lekat

Levene Statistic	df1	df2	Sig.
3.286	2	6	.109

ANOVA

Daya Lekat

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2470.417	2	1235.208	6670.392	.000
Within Groups	1.111	6	.185		
Total	2471.528	8			

Post Hoc Tests

Multiple Comparisons

Daya Lekat
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Formula 1	Formula 2	-36.29000*	.35136	.000	-37.3681	-35.2119
	Formula 3	-2.41333*	.35136	.001	-3.4914	-1.3353
Formula 2	Formula 1	36.29000*	.35136	.000	35.2119	37.3681
	Formula 3	33.87667*	.35136	.000	32.7986	34.9547
Formula 3	Formula 1	2.41333*	.35136	.001	1.3353	3.4914
	Formula 2	-33.87667*	.35136	.000	-34.9547	-32.7986

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Daya Lekat

Tukey HSD[a]

Formula	N	Subset for alpha = 0.05		
		1	2	3
Formula 1	3	3.7700		
Formula 3	3		6.1833	
Formula 2	3			40.0600
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

c. Daya Sebar Minggu 1

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Daya Sebar	9	4.7222	.96408	3.60	6.00

One-Sample Kolmogorov-Smirnov Test

		Daya Sebar
N		9
Normal Parameters[a,b]	Mean	4.7222
	Std. Deviation	.96408
Most Extreme Differences	Absolute	.189
	Positive	.189
	Negative	-.152
Kolmogorov-Smirnov Z		.566
Asymp. Sig. (2-tailed)		.905

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

Daya Sebar

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Formula 1	3	5.8667	.23094	.13333	5.2930	6.4404	5.60	6.00
Formula 2	3	3.6667	.05774	.03333	3.5232	3.8101	3.60	3.70
Formula 3	3	4.6333	.11547	.06667	4.3465	4.9202	4.50	4.70
Total	9	4.7222	.96408	.32136	3.9812	5.4633	3.60	6.00

Test of Homogeneity of Variances

Daya Sebar

Levene Statistic	df1	df2	Sig.
5.333	2	6	.047

ANOVA

Daya Sebar

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.296	2	3.648	156.333	.000
Within Groups	.140	6	.023		
Total	7.436	8			

Post Hoc Tests

Multiple Comparisons

Daya Sebar
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Formula 1	Formula 2	2.20000*	.12472	.000	1.8173	2.5827
	Formula 3	1.23333*	.12472	.000	.8507	1.6160
Formula 2	Formula 1	-2.20000*	.12472	.000	-2.5827	-1.8173
	Formula 3	-.96667*	.12472	.001	-1.3493	-.5840
Formula 3	Formula 1	-1.23333*	.12472	.000	-1.6160	-.8507
	Formula 2	.96667*	.12472	.001	.5840	1.3493

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Daya Sebar

Tukey HSD[a]

Formula	N	Subset for alpha = 0.05		
		1	2	3
Formula 2	3	3.6667		
Formula 3	3		4.6333	
Formula 1	3			5.8667
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

d. Daya Sebar Minggu 4

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Daya Lekat	9	5.2444	1.28268	3.50	6.50

One-Sample Kolmogorov-Smirnov Test

		Daya Lekat
N		9
Normal Parameters[a,b]	Mean	5.2444
	Std. Deviation	1.28268
Most Extreme Differences	Absolute	.276
	Positive	.219
	Negative	-.276
Kolmogorov-Smirnov Z		.828
Asymp. Sig. (2-tailed)		.500

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

Daya Lekat

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Formula 1	3	6.4667	.05774	.03333	6.3232	6.6101	6.40	6.50
Formula 2	3	3.6000	.10000	.05774	3.3516	3.8484	3.50	3.70
Formula 3	3	5.6667	.05774	.03333	5.5232	5.8101	5.60	5.70
Total	9	5.2444	1.28268	.42756	4.2585	6.2304	3.50	6.50

Test of Homogeneity of Variances

Daya Lekat

Levene Statistic	df1	df2	Sig.
.364	2	6	.709

ANOVA

Daya Lekat

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	13.129	2	6.564	1181.600	.000
Within Groups	.033	6	.006		
Total	13.162	8			

Post Hoc Tests

Multiple Comparisons

Daya Lekat
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Formula 1	Formula 2	2.86667*	.06086	.000	2.6799	3.0534
	Formula 3	.80000*	.06086	.000	.6133	.9867
Formula 2	Formula 1	-2.86667*	.06086	.000	-3.0534	-2.6799
	Formula 3	-2.06667*	.06086	.000	-2.2534	-1.8799
Formula 3	Formula 1	-.80000*	.06086	.000	-.9867	-.6133
	Formula 2	2.06667*	.06086	.000	1.8799	2.2534

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Daya Lekat

Tukey HSD[a]

Formula	N	Subset for alpha = 0.05		
		1	2	3
Formula 2	3	3.6000		
Formula 3	3		5.6667	
Formula 1	3			6.4667
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

e. Viskositas Minggu 1

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Viskositas	9	216.67	57.676	159	291

One-Sample Kolmogorov-Smirnov Test

		Viskositas
N		9
Normal Parameters[a,b]	Mean	216.67
	Std. Deviation	57.676
Most Extreme Differences	Absolute	.267
	Positive	.267
	Negative	-.228
Kolmogorov-Smirnov Z		.801
Asymp. Sig. (2-tailed)		.542

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

Viskositas

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	160.00	1.000	.577	157.52	162.48	159	161
2	3	290.00	1.000	.577	287.52	292.48	289	291
3	3	200.00	2.000	1.155	195.03	204.97	198	202
Total	9	216.67	57.676	19.225	172.33	261.00	159	291

Test of Homogeneity of Variances

Viskositas

Levene Statistic	df1	df2	Sig.
.667	2	6	.548

ANOVA

Viskositas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26600.000	2	13300.000	6650.000	.000
Within Groups	12.000	6	2.000		
Total	26612.000	8			

Post Hoc Tests

Multiple Comparisons

Viskositas

Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-130.000*	1.155	.000	-133.54	-126.46
	3	-40.000*	1.155	.000	-43.54	-36.46
2	1	130.000*	1.155	.000	126.46	133.54
	3	90.000*	1.155	.000	86.46	93.54
3	1	40.000*	1.155	.000	36.46	43.54
	2	-90.000*	1.155	.000	-93.54	-86.46

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Viskositas

Tukey HSD[a]

Formula	N	Subset for alpha = 0.05		
		1	2	3
1	3	160.00		
3	3		200.00	
2	3			290.00
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

f. Viskositas Minggu 4

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Viskositas	9	193.33	78.595	108	291

One-Sample Kolmogorov-Smirnov Test

		Viskositas
N		9
Normal Parameters[a,b]	Mean	193.33
	Std. Deviation	78.595
Most Extreme Differences	Absolute	.224
	Positive	.224
	Negative	-.222
Kolmogorov-Smirnov Z		.672
Asymp. Sig. (2-tailed)		.757

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

Viskositas

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	110.00	2.000	1.155	105.03	114.97	108	112
2	3	290.00	1.000	.577	287.52	292.48	289	291
3	3	180.00	2.000	1.155	175.03	184.97	178	182
Total	9	193.33	78.595	26.198	132.92	253.75	108	291

Test of Homogeneity of Variances

Viskositas

Levene Statistic	df1	df2	Sig.
.444	2	6	.661

ANOVA

Viskositas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	49400.000	2	24700.000	8233.333	.000
Within Groups	18.000	6	3.000		
Total	49418.000	8			

Post Hoc Tests

Multiple Comparisons

Viskositas

Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-180.000*	1.414	.000	-184.34	-175.66
	3	-70.000*	1.414	.000	-74.34	-65.66
2	1	180.000*	1.414	.000	175.66	184.34
	3	110.000*	1.414	.000	105.66	114.34
3	1	70.000*	1.414	.000	65.66	74.34
	2	-110.000*	1.414	.000	-114.34	-105.66

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Viskositas

Tukey HSD[a]

Formula	N	Subset for alpha = 0.05		
		1	2	3
1	3	110.00		
3	3		180.00	
2	3			290.00
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.