

DAFTAR PUSTAKA

- Andersen, F. A. (2008). Final report on the safety assessment of trichloroethane, *International Journal of Toxicology*, 27(4). 107–138.
- Bernstein, E. F., Sarkas, H. W., Boland, P., dan Bouche, D. (2020). Beyond sun protection factor: An approach to environmental protection with novel mineral coatings in a vehicle containing a blend of skincare ingredients, *Journal of Cosmetic Dermatology*, 19(2). 407–415.
- Burmanni, C., Gustiani, D., Priani, S.E., dan Darusman, F. (2015). Pengaruh Jenis Minyak terhadap Nilai Faktor Pelindung Surya (Fps) Sediaan Emulgel Tabir Surya Mengandung Ekstrak Etanol Kulit Batang Kayu Manis. 574–582.
- Cox Gad, S. (2008). *Pharmaceutical Manufacturing Handbook Production and Processes*. A John Wiley & Sons, Inc., New Jersey.
- David Jones (2008). Fast track Pharmaceuticals - Dosage Form and Design, in. Pharmaceutical Press. London.
- David Troy (2005). Remington the science and Practice of Pharmacy, in *Journal of Chemical Information and Modeling*. Informa Healthcare USA, Inc. 1689–1699.
- Dutra, E. A., Oliveira, D. A., Hackman, E. R., dan Santoro, M. I. R. (2004). Determination of sun protection factor (SPF) of sunscreens by ultraviolet spectrophotometry, 40(3). 381-384.
- Elcistia, R. dan Zulkarnain, A. K. (2019). Optimasi Formula Sediaan Krim o/w Kombinasi Oksibenzon dan Titanium Dioksida Serta Uji Aktivitas Tabir Suryanya Secara In Vivo, *Majalah Farmaseutik*, 14(2). 63-78.
- Gibson, M. (2005). *Pharmaceutical Preformulation and Formulation: A Practical Guide from Candidate Drug Selection to Commercial Dosage Form, Organic Process Research & Development*. CRC Press, 346, Pharmaceutical Press. United Kingdom.
- Hidayat, I. R., Zuhrotun, A. dan Sopyan, I. (2020). Design-Expert Software sebagai Alat Optimasi Formulasi Sediaan Farmasi, *Majalah Farmasetika*, 6(1). 99-120.
- Hooton, J., Kibbe A., Crehan E. (2017). *Handbook of Pharmaceutical Excipients*. Pharmaceutical Press. USA.
- Imogene, S. (2006). Update of Sunscreen Ingredients Nomination to NTP Imogene Sevin, Ph.D. Technical Resources International, Inc. Bethesda, MD, United State.
- Ismail, I., Tinggi, S. dan Farmasi, I. (2018). *Pengaruh Variasi Konsentra Emulgator Phytocream Terhadap Kestabilan Fisik Formula Krim*

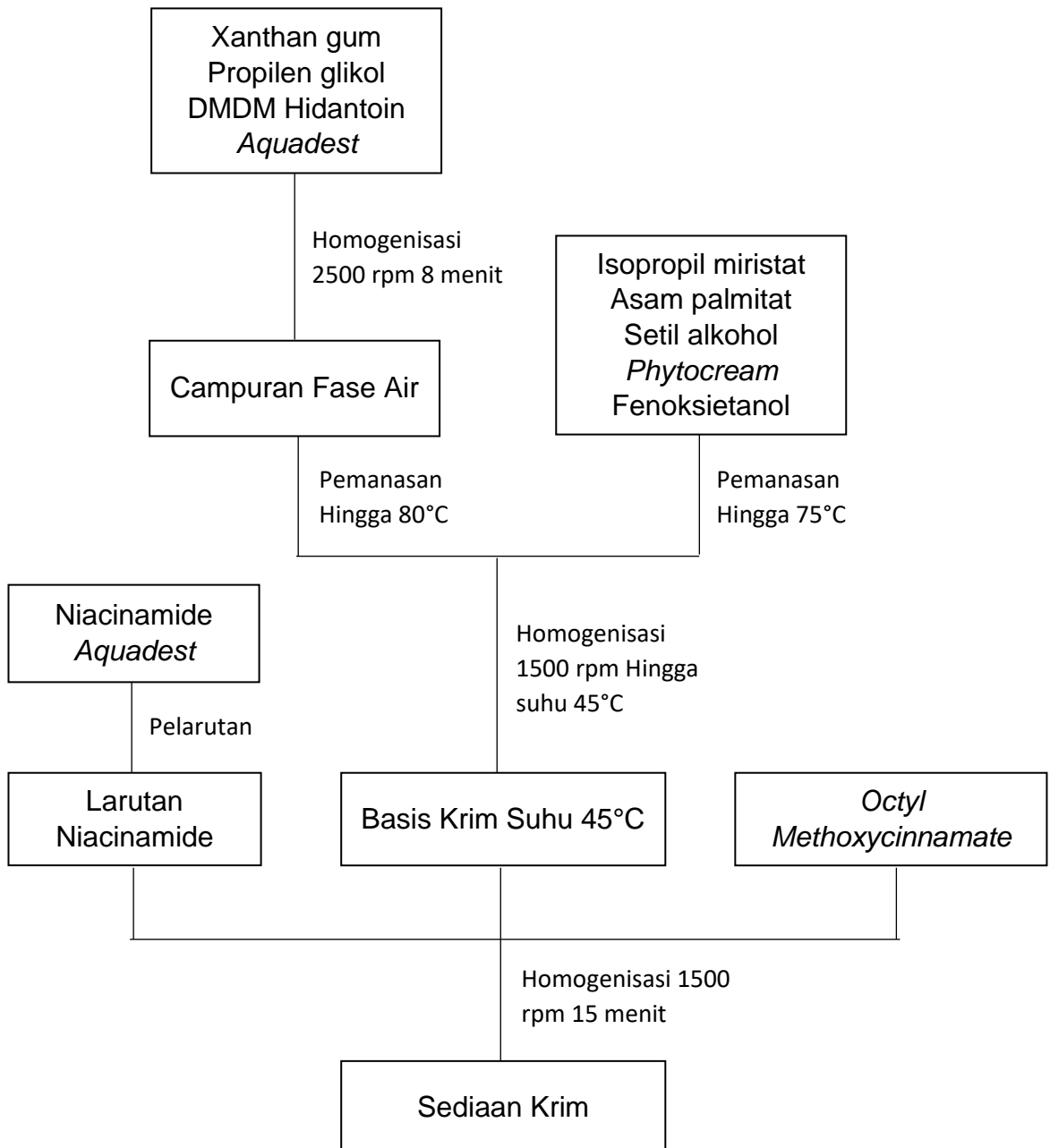
Ekstrak Etanol Daun Kelor (Moringa oleifera L) dalam Menghambat Propionibacterium acnes. ISRN Pharmaceutics. 29-42.

- Janjua, N. R., Mogensen, B., Andersson, A. M., Peterson, J. H., Henriksen, M., Skakkeak, N. E., dan Wulf, H. C. (2004). Systemic absorption of the sunscreens benzophenone-3, octyl- methoxycinnamate, and 3-(4-methyl-benzylidene) camphor after whole-body topical application and reproductive hormone levels in humans, *Journal of Investigative Dermatology*, 123(1). 57–61.
- Jitek, A. (2016). Pengembangan Basis Cold Cream Ekstrak Kulit Buah Manggis (*Garcinia mangostana L.*) Yang Memenuhi Sifat Farmasetis , *Jurnal Ilmiah Teknosains*, 2(11). 133-142.
- Kanlayavattanukul, M., Kasikawatana, N. dan Lourith, N. (2016). Analysis of octyl methoxycinnamate in sunscreen products by a validated UV-spectrophotometric method, *Journal of Cosmetic Science*, 67(3). 167–173.
- Kim, S. Y., Lamichhane, S., Ju, J. H., dan Yun, J. (2018). Protective effect of octylmethoxycinnamate against UV-induced photoaging in hairless mouse via the regulation of matrix metalloproteinases, *International Journal of Molecular Sciences*, 19(7). 1–10.
- Latha, M. S., Martis, J., Shobha, Shinde, R. S., dan Bangera S. (2013) . Sunscreening agents: A review, *Journal of Clinical and Aesthetic Dermatology*, 6(1). 16–26.
- Malakar, J., Nayak, A. K. dan Goswami, S. (2012). Use of Response Surface Methodology in the Formulation and Optimization of Bisoprolol Fumarate Matrix Tablets for Sustained Drug Release, *ISRN Pharmaceutics*, 2012. 1–10.
- Mongotmery, D. C. (2012). Response surface method and designs, *Design and analysis of experiments*. Journal of the Royal Statistical Society Series 13(1). 201-245.
- Namazi, M. R. (2003). Nicotinamide-containing sunscreens for use in Australasian countries and cancer-provoking conditions, *Medical Hypotheses*, 60(4). 544–545.
- Ngoc, L. T. N., Tran V. V., Moon J. Y., Chae M., Park D., dan Lee Y. C. (2019). Recent trends of sunscreen cosmetic: An update review, *Cosmetics*, 6(4).
- Paul, S. P. (2019). Ensuring the Safety of Sunscreens , and Their Efficacy in Preventing Skin Cancers: Challenges and Controversies for Clinicians , Formulators , and Regulators Hormonal Effects of Chemicals in, 6(1). 1–7.
- Pawar, A. P., Gholap A. P., Kuchekar A. B., Bothiraja C., dan Mali A.J.

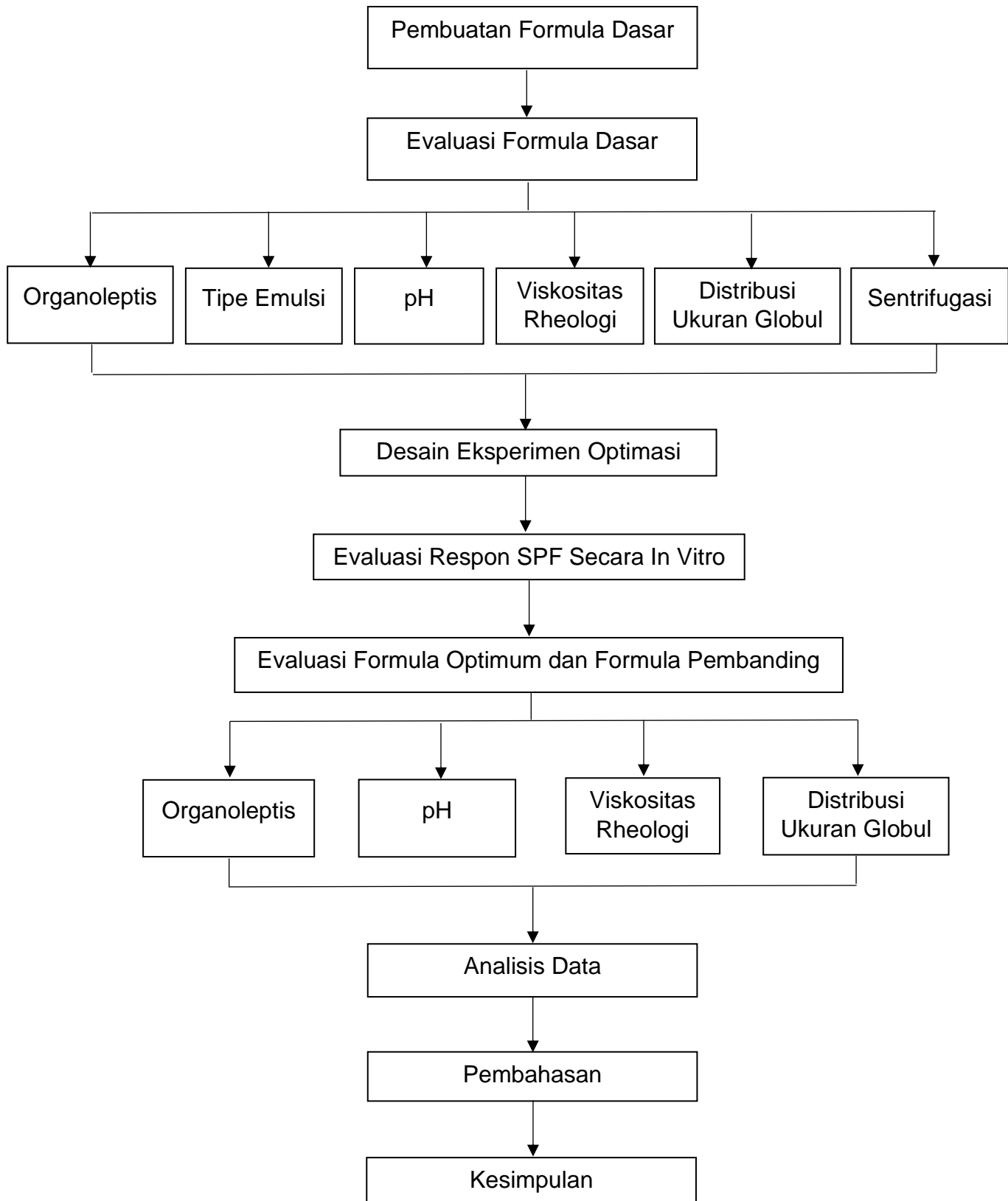
- (2015). Formulation and Evaluation of Optimized Oxybenzone Microsponge Gel for Topical Delivery, *Journal of Drug Delivery*, 2015. 1–9.
- Politis, S. N., Colombo P., Colombo G., dan Rekkas D. M. (2017). Design of experiments (DoE) in pharmaceutical development, *Drug Development and Industrial Pharmacy*, 43(6). 889–901.
- Ratnawati, S. E., Ekantari N., Pradipta R. W., dan Paramita B. L. (2018). Aplikasi Response Surface Methodology (RSM) pada Optimasi Ekstraksi Kalsium Tulang Lele The Application of Response Surface Methodology (RSM) on the Optimization of Catfish Bone Calcium Extraction, *Jurnal Perikanan Universitas Gadjah Mada*, 20(1). 41–48.
- Restu, W. K., Sampora, Y., Meliana, Y., dan Haryono A. (2015). Effect of Accelerated Stability Test on Characteristics of Emulsion Systems with Chitosan as a Stabilizer, *Procedia Chemistry*, 16. 171–176.
- Rhee, Y. S., Chang, S. Y., Park, C. W., Chi, S. C., dan Park, E. S. (2008). Optimization of ibuprofen gel formulations using experimental design technique for enhanced transdermal penetration, *International Journal of Pharmaceutics*, 364(1). 14–20.
- Sinko, P. J. (2011). *Farmasi Fisika dan Ilmu Farmasetika*. Kementerian Kesehatan Indonesia. Jakarta, Indonesia.
- Snidr, V. A., Damian, D. L. dan Halliday, G. M. (2019). Nicotinamide for photoprotection and skin cancer chemoprevention: A review of efficacy and safety, *Experimental Dermatology*, 28(2). 15–22.

LAMPIRAN

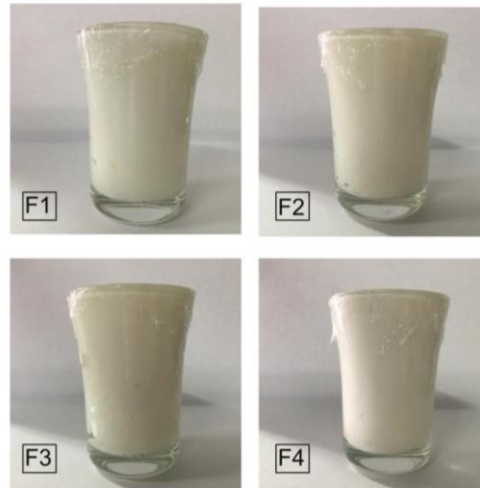
Lampiran 1 Pembuatan Krim Tabir Surya



Lampiran 2 Alur Kerja Penelitian



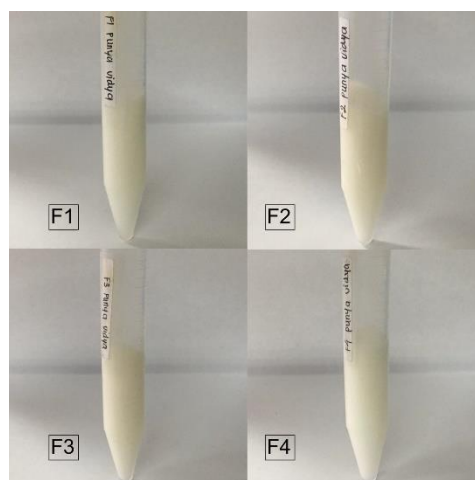
Lampiran 3 Gambar Penelitian



Gambar 25. Basis Formula

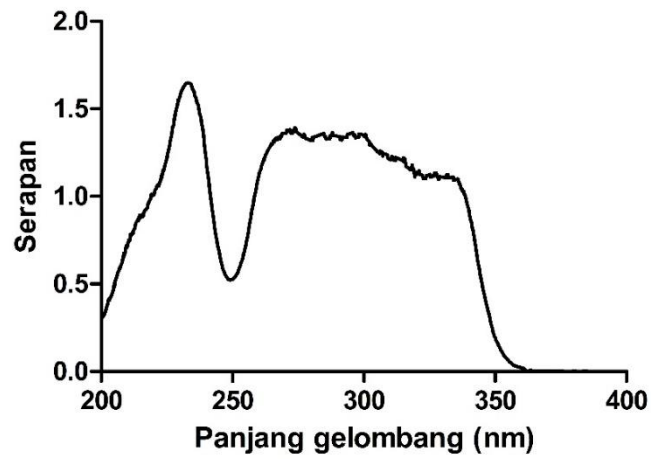


Gambar 26. Hasil Uji Tipe Emulsi (a) metode pewarnaan, (b) metode pengenceran

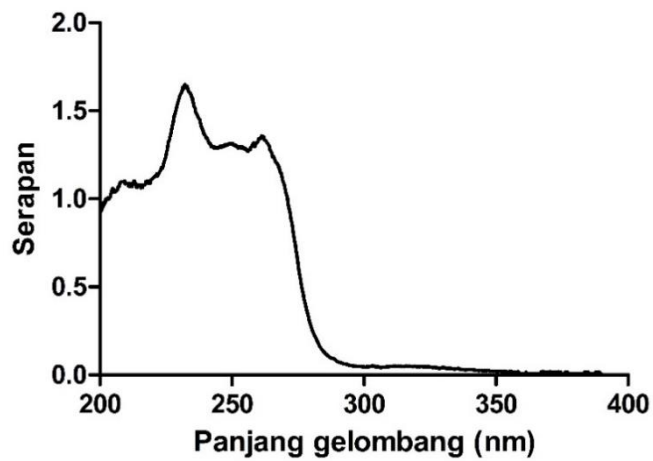


Gambar 27. Hasil Uji Sentrifugasi

Lampiran 4 Panjang Gelombang Serapan Zat Aktif



Gambar 28. Panjang Gelombang Serapan Octylmethoxycinnamate



Gambar 29. Panjang Gelombang Serapan Niacinamide

Lampiran 5 Tabel Hasil Evaluasi

Lampiran 5.1 Tabel Hasil Pengamatan Organoleptis

Formula	Parameter		
	Bentuk	Warna	Aroma
F1	Semi Padat	Putih	Berbau Khas
F2	Semi Padat	Agak Kekuningan	Berbau Khas
F3	Semi Padat	Agak Kekuningan	Berbau Khas
F4	Semi Padat	Putih	Berbau Khas

Lampiran 5.2 Tabel Hasil Evaluasi pH Formula Dasar

Formula	Replikasi	pH	Rata-rata	SD
F1	1	5.91	5.893333	0.020817
	2	5.9		
	3	5.87		
F2	1	5.84	5.71	0.225167
	2	5.45		
	3	5.84		
F3	1	5.79	5.713333	0.196554
	2	5.49		
	3	5.86		
F4	1	5.52	5.506667	0.015275
	2	5.49		
	3	5.51		

Lampiran 5.3 Tabel Hasil Evaluasi Viskositas Formula Dasar

Formula	Replikasi	Viskositas (cPs)	Rata-rata	SD
F1	1	31200	33600	2400
	2	33600		
	3	36000		
F2	1	44800	45600	800
	2	46400		
	3	45600		
F3	1	64000	63600	400
	2	63600		
	3	63200		
F4	1	37600	36000	1385.641
	2	35200		
	3	35200		

Lampiran 5.4 Tabel Hasil Evaluasi Distribusi Ukuran Globul

F1		F2		F3		F4	
d (μm)	A (μm^2)	d (μm)	A (μm^2)	d (μm)	A (μm^2)	d (μm)	A (μm^2)
1.67	2.18	5.55	24.20	6.43	32.44	9.77	74.92
2.77	6.02	4.54	16.22	4.12	13.36	11.42	102.42
2.76	5.97	3.60	10.20	4.14	13.46	14.44	163.73
2.12	3.52	2.55	5.11	6.79	36.25	9.47	70.44
2.30	4.15	2.31	4.20	2.83	6.31	10.09	80.04
3.42	9.17	2.76	5.99	3.58	10.08	4.59	16.53
4.68	17.24	2.21	3.84	2.18	3.73	11.57	105.10
2.49	4.88	5.83	26.71	3.09	7.48	5.32	22.25
1.94	2.96	6.09	29.12	7.13	39.97	5.06	20.07
1.86	2.70	1.67	2.18	3.42	9.17	6.13	29.48
1.54	1.85	9.22	66.84	1.90	2.82	7.58	45.15
5.43	23.12	3.07	7.39	8.63	58.47	3.66	10.53
3.29	8.49	2.84	6.33	3.61	10.23	7.88	48.81
4.90	18.85	4.84	18.41	4.01	12.62	5.44	23.21
2.59	5.26	2.90	6.59	3.47	9.48	3.24	8.22
3.21	8.12	2.60	5.29	4.48	15.73	6.68	35.03
2.24	3.94	1.85	2.69	1.74	2.39	5.64	24.98
2.67	5.59	2.16	3.67	2.29	4.13	3.34	8.78
2.10	3.48	5.03	19.89	3.18	7.94	2.83	6.29
3.51	9.67	5.53	24.05	8.82	61.03	5.39	22.85
2.14	3.60	7.53	44.49	1.69	2.24	2.55	5.12
4.20	13.84	15.99	200.81	2.41	4.57	2.71	5.77
9.35	68.66	4.04	12.81	7.05	39.02	8.39	55.26
2.00	3.15	8.09	51.38	3.26	8.33	6.08	29.00
2.84	6.35	9.06	64.54	1.65	2.13	13.71	147.57
1.51	1.80	4.32	14.65	2.41	4.55	8.65	58.70
2.92	6.69	11.22	98.95	2.01	3.16	4.04	12.81
4.12	13.36	1.73	2.36	3.02	7.18	3.89	11.89
8.00	50.25	4.93	19.06	3.69	10.68	3.22	8.13
4.30	14.55	2.60	5.33	7.50	44.15	6.87	37.04
2.62	5.37	6.30	31.21	2.04	3.28	5.46	23.41
2.70	5.74	2.42	4.58	2.63	5.45	2.92	6.71
4.96	19.35	1.94	2.96	2.44	4.69	8.88	61.95
4.11	13.25	6.16	29.76	1.95	2.97	6.73	35.61
3.53	9.78	5.83	26.70	1.77	2.45	9.90	77.03
6.55	33.66	2.66	5.58	2.60	5.32	5.29	21.97
8.11	51.63	2.10	3.46	5.69	25.41	9.63	72.84

3.65	10.46	3.99	12.47	1.55	1.90	6.66	34.79
4.49	15.80	3.95	12.28	11.05	95.82	14.60	167.36
7.53	44.50	1.67	2.18	5.50	23.77	5.52	23.90
6.27	30.84	2.06	3.33	5.84	26.80	4.54	16.17
2.00	3.13	3.60	10.17	4.54	16.17	5.75	25.94
3.81	11.40	7.27	41.56	5.72	25.65	11.77	108.77
3.79	11.26	8.11	51.67	1.72	2.31	3.68	10.66
3.94	12.16	4.24	14.12	1.95	2.99	6.86	36.91
3.57	10.01	2.08	3.41	3.35	8.82	13.39	140.78
5.03	19.91	5.97	28.03	4.83	18.36	10.28	82.98
5.66	25.18	6.64	34.61	2.96	6.86	7.10	39.61
5.64	24.97	2.62	5.38	2.46	4.75	3.23	8.18
7.09	39.46	2.18	3.72	3.41	9.16	2.90	6.63
2.02	3.22	2.84	6.33	6.75	35.82	3.76	11.12
7.45	43.63	1.56	1.92	4.80	18.12	4.82	18.27
6.35	31.66	2.87	6.48	3.14	7.77	8.65	58.76
4.56	16.31	1.77	2.46	1.99	3.10	10.78	91.22
2.58	5.25	2.38	4.44	7.76	47.24	3.05	7.29
1.73	2.35	1.69	2.24	7.06	39.14	3.83	11.52
1.93	2.92	1.33	1.40	1.78	2.49	3.89	11.89
2.14	3.61	5.70	25.56	1.89	2.81	4.31	14.62
1.87	2.75	1.95	2.99	4.89	18.78	3.92	12.08
3.73	10.94	2.68	5.64	2.59	5.26	3.58	10.05
5.20	21.26	2.01	3.16	3.73	10.95	7.21	40.82
8.89	62.02	2.29	4.10	1.83	2.64	5.59	24.51
2.30	4.16	4.16	13.57	6.25	30.68	7.02	38.69
4.30	14.54	3.52	9.74	4.59	16.51	10.34	83.94
2.33	4.26	2.24	3.94	3.16	7.85	4.52	16.08
2.77	6.01	5.70	25.52	4.11	13.29	6.89	37.33
5.04	19.99	7.52	44.42	3.29	8.50	15.42	186.71
2.71	5.78	4.19	13.81	4.92	19.00	6.21	30.33
1.61	2.03	3.03	7.22	4.15	13.52	8.46	56.20
1.53	1.85	7.63	45.69	4.06	12.91	8.40	55.36
5.16	20.90	5.03	19.87	2.59	5.26	9.72	74.24
5.86	27.01	1.65	2.14	3.12	7.64	4.39	15.17
8.20	52.79	2.44	4.66	2.43	4.62	5.91	27.41
6.21	30.30	5.62	24.78	2.04	3.27	5.78	26.20
1.67	2.19	8.01	50.39	6.96	38.09	7.84	48.31
4.81	18.18	1.51	1.78	5.17	21.02	2.89	6.56
6.20	30.16	5.52	23.94	2.01	3.17	6.68	35.08
4.40	15.23	3.00	7.06	1.96	3.02	4.52	16.02

7.58	45.17	5.33	22.30	2.34	4.30	2.22	3.87
6.49	33.07	3.06	7.36	5.23	21.47	12.32	119.20
3.38	8.96	3.51	9.70	2.79	6.10	8.35	54.79
7.05	39.07	2.57	5.19	3.69	10.67	6.64	34.61
3.10	7.55	4.02	12.67	7.02	38.71	12.64	125.50
3.30	8.56	5.93	27.59	4.68	17.22	15.47	187.85
2.13	3.57	3.25	8.29	2.49	4.87	3.74	10.99
2.93	6.73	2.36	4.36	3.37	8.92	12.30	118.77
3.96	12.29	5.86	26.97	4.63	16.82	3.04	7.24
3.44	9.28	8.46	56.17	4.69	17.27	9.28	67.68
8.36	54.87	1.78	2.50	3.76	11.08	7.28	41.67
5.33	22.32	4.21	13.91	2.09	3.42	4.22	14.01
6.94	37.77	7.93	49.45	3.03	7.19	10.93	93.84
2.99	7.02	5.88	27.17	6.10	29.26	7.62	45.64
2.36	4.36	3.33	8.70	8.39	55.28	7.43	43.40
5.16	20.91	3.32	8.65	6.07	28.90	6.32	31.41
7.31	41.93	5.81	26.50	3.71	10.80	5.73	25.77
6.13	29.52	2.25	3.98	3.29	8.52	6.42	32.34
3.27	8.38	12.14	115.74	2.93	6.75	7.69	46.46
2.35	4.34	10.06	79.49	7.19	40.59	7.11	39.68
2.79	6.10	3.95	12.24	4.26	14.23	8.13	51.89
3.55	9.92	6.04	28.61	2.28	4.07	9.91	77.12
3.98	12.43	5.74	25.89	2.10	3.47	7.01	38.59
1.80	2.56	1.44	1.63	3.72	10.87	3.18	7.97
4.09	13.17	1.53	1.84	3.25	8.32	7.25	41.28
4.12	13.36	2.16	3.67	5.41	22.98	4.24	14.13
4.48	15.76	3.68	10.64	6.82	36.49	9.79	75.21
1.81	2.57	1.77	2.45	5.75	25.92	8.18	52.56
1.50	1.77	2.02	3.21	4.55	16.27	2.66	5.56
2.97	6.92	3.49	9.59	5.27	21.78	15.93	199.27
3.55	9.90	2.75	5.96	4.35	14.88	6.14	29.62
4.04	12.85	5.51	23.82	5.27	21.82	5.52	23.90
2.14	3.59	1.61	2.03	4.41	15.25	14.14	157.09
2.58	5.23	3.12	7.66	2.50	4.92	3.15	7.80
4.36	14.95	4.89	18.75	2.84	6.32	17.35	236.33
2.83	6.27	4.81	18.21	1.76	2.43	17.34	236.12
2.89	6.56	4.37	15.02	3.50	9.61	9.83	75.83
3.21	8.07	5.75	25.93	2.52	5.00	8.54	57.32
1.36	1.45	2.89	6.56	8.79	60.75	3.67	10.58
1.59	1.98	2.80	6.16	4.65	17.01	6.01	28.36
6.00	28.23	1.84	2.65	3.47	9.44	8.68	59.15

3.48	9.51	1.78	2.48	2.98	6.96	8.14	52.04
2.14	3.59	3.01	7.12	1.94	2.94	9.87	76.46
6.19	30.12	6.00	28.26	1.39	1.52	2.92	6.69
3.24	8.24	1.85	2.67	3.42	9.21	8.86	61.61
2.22	3.87	2.23	3.89	2.84	6.33	6.27	30.85
4.08	13.05	2.90	6.63	2.52	5.01	11.22	98.96
9.64	72.96	5.16	20.88	2.17	3.70	11.38	101.73
8.66	58.90	5.27	21.80	3.42	9.19	14.79	171.69
1.78	2.49	2.76	5.99	1.85	2.69	7.93	49.43
1.40	1.53	7.02	38.74	2.01	3.18	10.90	93.33
3.85	11.64	4.44	15.50	1.50	1.76	8.23	53.25
12.36	120.08	2.07	3.37	4.53	16.15	5.80	26.41
5.57	24.40	2.13	3.57	4.14	13.44	11.99	112.96
6.94	37.86	5.55	24.21	5.24	21.56	10.16	81.02
7.76	47.32	4.00	12.55	2.47	4.80	8.49	56.59
3.05	7.28	1.66	2.16	4.58	16.44	10.07	79.58
7.59	45.28	5.72	25.69	4.13	13.39	14.33	161.25
9.59	72.27	3.86	11.71	3.17	7.88	4.78	17.96
3.04	7.26	2.18	3.73	1.99	3.12	5.44	23.22
12.19	116.71	2.22	3.88	3.48	9.51	11.49	103.67
5.51	23.82	2.63	5.42	4.74	17.63	6.14	29.57
4.50	15.92	2.20	3.81	2.46	4.74	4.80	18.10
5.96	27.88	1.98	3.07	1.94	2.94	11.86	110.43
2.54	5.08	5.81	26.47	2.01	3.18	9.37	68.96
7.45	43.54	2.26	4.00	3.98	12.43	4.69	17.24
3.79	11.29	2.19	3.78	1.50	1.76	2.34	4.31
4.78	17.92	8.70	59.43	1.82	2.59	8.39	55.25
3.77	11.18	2.47	4.78	2.17	3.71	4.82	18.27
5.18	21.07	2.52	5.01	3.28	8.46	9.29	67.77
4.13	13.39	4.74	17.66	6.15	29.67	9.63	72.77
2.85	6.39	3.33	8.69	6.22	30.37	10.40	85.01
12.19	116.79	2.29	4.13	4.73	17.56	5.01	19.69
16.56	215.50	2.52	4.99	9.45	70.10	11.46	103.20
3.92	12.07	1.23	1.20	6.51	33.30	13.48	142.71
2.29	4.10	1.52	1.82	11.34	100.92	8.20	52.76
10.21	81.83	1.69	2.24	4.41	15.29	4.21	13.95
5.54	24.13	3.53	9.80	3.64	10.41	5.34	22.36
5.55	24.19	1.87	2.76	5.62	24.82	4.30	14.49
2.05	3.31	2.21	3.84	2.64	5.47	6.17	29.92
1.86	2.70	2.32	4.24	4.73	17.56	4.77	17.84
1.43	1.61	8.17	52.37	2.83	6.29	11.97	112.56

1.83	2.64	6.53	33.49	7.20	40.68	12.30	118.88
2.31	4.21	7.85	48.35	2.48	4.84	5.93	27.60
6.84	36.75	3.87	11.78	5.95	27.80	11.28	100.00
2.48	4.85	4.47	15.67	5.24	21.54	13.80	149.65
5.52	23.95	4.32	14.63	3.76	11.12	6.13	29.53
1.72	2.32	2.93	6.75	3.22	8.14	5.53	24.00
1.69	2.25	2.32	4.23	6.39	32.04	7.77	47.41
4.59	16.53	3.10	7.57	6.01	28.36	13.97	153.29
3.98	12.45	1.55	1.89	2.36	4.37	11.56	105.04
9.91	77.15	4.74	17.63	4.19	13.78	8.54	57.25
9.20	66.41	1.98	3.07	2.90	6.58	5.89	27.23
9.40	69.42	3.82	11.45	2.86	6.42	3.61	10.24
3.52	9.76	2.44	4.68	5.25	21.62	11.93	111.81
4.34	14.76	2.07	3.37	2.46	4.75	17.07	228.78
7.33	42.23	4.73	17.55	2.12	3.52	4.60	16.63
3.03	7.20	8.12	51.74	2.42	4.60	6.46	32.77
2.69	5.67	2.07	3.35	2.41	4.56	4.47	15.68
7.73	46.89	3.63	10.34	1.68	2.21	7.51	44.33
2.40	4.52	1.30	1.32	4.60	16.61	2.53	5.04
11.06	95.99	2.08	3.41	3.40	9.07	12.31	119.06
2.13	3.57	1.95	2.98	4.89	18.78	8.65	58.82
5.13	20.63	2.79	6.13	5.36	22.55	5.36	22.59
3.75	11.03	2.40	4.52	2.62	5.38	6.27	30.92
8.89	62.04	1.35	1.44	1.72	2.33	7.70	46.55
2.31	4.20	1.84	2.65	1.58	1.97	8.13	51.88
1.46	1.66	1.02	0.82	2.86	6.41	6.58	33.99
9.85	76.19	3.43	9.24	2.52	4.97	8.90	62.19
9.03	64.01	5.47	23.46	2.21	3.84	14.35	161.67
7.26	41.38	4.62	16.76	2.07	3.38	5.88	27.15
2.97	6.94	1.91	2.88	8.67	59.03	6.48	32.98
3.21	8.09	2.18	3.73	6.07	28.91	13.82	149.98
3.99	12.49	2.00	3.15	6.27	30.90	11.33	100.77
10.85	92.47	4.73	17.59	2.09	3.44	9.02	63.87
1.62	2.06	4.84	18.40	1.34	1.41	6.76	35.90
2.21	3.82	3.33	8.71	3.63	10.35	9.41	69.54
6.26	30.74	6.07	28.95	4.17	13.66	9.74	74.45
13.10	134.75	2.05	3.30	9.44	69.93	3.32	8.68
3.02	7.16	2.77	6.04	4.61	16.71	22.14	384.95
2.36	4.36	1.75	2.41	7.05	39.04	12.60	124.72
1.54	1.86	1.72	2.31	2.72	5.80	6.26	30.74
2.51	4.96	10.99	94.89	2.88	6.51	11.60	105.65

12.36	119.95	4.39	15.10	2.05	3.29	6.98	38.29
3.79	11.30	4.13	13.39	2.15	3.61	5.86	26.95
2.97	6.93	2.62	5.37	2.89	6.56	14.32	161.01
2.45	4.73	6.57	33.92	3.90	11.97	10.84	92.20
5.34	22.36	10.82	92.03	6.03	28.55	13.18	136.46
5.01	19.69	3.27	8.41	3.54	9.82	7.81	47.93
4.12	13.34	1.93	2.93	3.57	10.02	4.78	17.97
1.93	2.92	1.14	1.03	3.56	9.94	6.21	30.30
3.81	11.40	2.41	4.57	5.02	19.81	9.32	68.25
9.26	67.39	3.65	10.45	5.87	27.03	3.34	8.78
2.69	5.67	2.04	3.26	1.99	3.12	4.47	15.71
1.88	2.78	4.58	16.46	2.29	4.13	8.86	61.68
2.44	4.67	1.29	1.31	4.11	13.26	7.30	41.84
2.12	3.54	4.30	14.49	8.90	62.26	9.97	78.09
4.61	16.72	4.89	18.77	6.07	28.95	5.69	25.40
7.98	50.01	3.68	10.65	4.75	17.70	9.54	71.54
1.83	2.64	1.49	1.75	8.07	51.13	6.43	32.48
1.85	2.70	4.04	12.83	8.46	56.26	9.65	73.14
7.63	45.74	1.84	2.67	3.12	7.65	14.49	164.97
7.01	38.64	1.86	2.70	2.04	3.26	3.92	12.08
1.99	3.10	6.61	34.29	12.34	119.51	8.13	51.86
2.71	5.75	4.27	14.32	10.06	79.56	10.24	82.40
3.70	10.78	1.86	2.72	3.17	7.89	7.26	41.40
2.04	3.27	2.92	6.71	4.36	14.96	5.71	25.58
5.99	28.19	1.76	2.43	3.75	11.03	6.31	31.28
5.97	28.02	11.33	100.74	3.78	11.25	9.04	64.15
2.87	6.46	3.27	8.39	4.82	18.23	6.24	30.62
1.60	2.01	3.94	12.19	3.48	9.51	13.86	150.93
1.58	1.97	6.95	37.93	3.41	9.16	14.14	157.04
2.44	4.69	3.47	9.44	7.08	39.41	3.94	12.21
1.77	2.47	5.70	25.52	2.91	6.64	14.04	154.84
2.57	5.17	2.61	5.33	3.32	8.66	7.03	38.82
1.91	2.87	3.56	9.94	3.82	11.46	14.55	166.27
3.91	12.03	6.16	29.84	4.10	13.20	3.13	7.69
1.69	2.25	3.75	11.02	2.39	4.49	12.07	114.42
2.03	3.24	11.43	102.61	7.26	41.35	10.19	81.52
5.42	23.05	6.36	31.82	10.39	84.78	14.07	155.57
1.74	2.37	8.88	61.92	3.52	9.76	16.78	221.05
3.19	8.00	4.98	19.48	2.98	6.97	5.88	27.16
3.67	10.61	1.86	2.72	2.65	5.51	8.81	60.98
4.65	17.02	2.52	5.01	6.26	30.81	14.07	155.42

3.97	12.40	7.88	48.72	3.81	11.42	7.08	39.41
5.14	20.73	5.58	24.49	2.24	3.93	3.96	12.29
6.38	31.98	5.66	25.13	2.46	4.76	12.64	125.40
11.11	96.86	2.54	5.07	5.66	25.15	10.94	93.96
4.80	18.13	3.38	8.98	1.41	1.57	13.28	138.59
6.12	29.37	1.33	1.39	1.95	3.00	7.49	44.07
5.14	20.72	5.33	22.33	1.80	2.54	4.14	13.46
4.76	17.79	1.92	2.90	5.87	27.09	2.72	5.81
4.10	13.18	3.15	7.77	1.47	1.70	2.41	4.54
0.82	0.52	2.09	3.44	3.14	7.73	2.30	4.14
1.48	1.73	6.70	35.25	5.76	26.02	9.21	66.58
5.73	25.80	1.65	2.15	8.97	63.23	1.57	1.94
6.19	30.13	3.83	11.53	3.03	7.19	3.90	11.92
4.89	18.75	3.44	9.30	2.53	5.03	8.88	61.97
7.22	40.94	2.07	3.35	4.75	17.70	6.72	35.45
1.29	1.30	1.33	1.40	2.94	6.81	4.68	17.21
1.28	1.29	7.51	44.34	6.53	33.51	8.95	62.98
4.03	12.75	3.50	9.64	5.95	27.79	8.60	58.02
2.37	4.43	5.33	22.29	1.44	1.63	6.37	31.87
4.22	14.00	5.56	24.30	5.42	23.11	4.19	13.76
4.29	14.46	1.77	2.45	2.00	3.14	6.44	32.59
1.80	2.55	1.72	2.31	3.17	7.89	11.67	107.04
6.92	37.65	2.76	5.99	5.54	24.09	10.11	80.20
9.39	69.29	1.92	2.89	5.34	22.38	6.04	28.67
5.34	22.38	5.09	20.33	6.95	37.88	4.77	17.84
3.76	11.08	2.50	4.90	5.28	21.89	7.92	49.29
5.11	20.48	2.24	3.94	4.99	19.53	8.64	58.68
7.67	46.16	1.05	0.87	2.65	5.51	12.30	118.91
8.09	51.42	1.73	2.36	1.91	2.86	4.60	16.65
12.57	124.14	4.02	12.72	2.02	3.22	7.63	45.70
7.31	42.02	1.35	1.44	2.08	3.40	8.66	58.85
3.20	8.06	5.26	21.76	4.44	15.50	3.35	8.80
2.81	6.22	1.78	2.48	4.87	18.64	4.57	16.39
3.99	12.49	6.82	36.54	3.90	11.92	4.92	19.01
16.27	207.82	5.69	25.45	13.42	141.43	6.64	34.67
17.08	229.03	3.97	12.39	2.55	5.12	8.86	61.68
7.38	42.83	2.99	7.04	2.40	4.51	2.79	6.09
9.71	74.00	2.91	6.63	5.35	22.46	4.56	16.33
12.31	119.08	1.29	1.30	5.89	27.21	3.13	7.70
14.87	173.74	1.21	1.15	3.98	12.42	2.03	3.23
18.27	262.22	5.85	26.90	4.65	16.95	7.19	40.65

5.34	22.37	4.11	13.24	4.03	12.77	1.86	2.73	
7.48	43.89	2.52	4.98	4.18	13.75	6.61	34.31	
8.57	57.64	2.25	3.97	2.81	6.18	7.97	49.85	
8.93	62.65	4.52	16.02	5.68	25.30	7.68	46.33	
13.46	142.31	1.84	2.65	2.99	7.04	2.85	6.39	
2.60	5.33	2.32	4.24	5.55	24.17	3.42	9.19	
5.40	22.89	7.84	48.33	2.71	5.77	3.71	10.81	
4.94	19.13	12.09	114.87	6.23	30.47	2.82	6.27	
3.00	7.05	8.46	56.20	6.92	37.65	4.58	16.44	
7.82	47.99	2.51	4.94	3.13	7.70	4.65	16.99	
6.52	33.40	2.48	4.81	5.63	24.94	2.54	5.08	
7.45	43.58	2.98	6.99	3.76	11.13	4.05	12.91	
7.47	43.88	1.47	1.71	4.63	16.85	6.03	28.56	
4.22	14.01	1.84	2.66	3.17	7.90	4.97	19.37	
2.28	4.07	3.29	8.48	3.13	7.68	1.91	2.86	
2.45	4.70	2.34	4.31	6.89	37.25	1.80	2.54	
3.43	9.22	2.77	6.01	5.76	26.07	1.83	2.64	
\bar{x}	4.75	25.02	3.89	16.26	4.11	16.73	7.56	55.36
SD	3.06	36.26	2.36	22.38	2.10	18.77	3.66	52.69

Lampiran 5.5 Tabel Hasil Evaluasi SPF Secara In-Vitro

Formula	Replikasi	SPF	Rata-rata	SD
OF1	1	12.086052	11.65464133	0.37
	2	11.442346		
	3	11.435526		
OF2	1	12.929461	12.818847	0.10
	2	12.770064		
	3	12.757016		
OF3	1	13.083992	13.083992	0.0
	2	13.083992		
	3	13.083992		
OF4	1	12.398508	12.41171867	0.01
	2	12.418324		
	3	12.418324		
OF5	1	13.32802	13.25194367	0.21
	2	13.019319		
	3	13.408492		
OF6	1	13.254386	13.254386	0,0
	2	13.254386		
	3	13.254386		
OF7	1	12.679972	12.501328	0.30
	2	12.156433		
	3	12.667579		
OF8	1	13.183269	13.16498733	0.08
	2	13.079566		
	3	13.232127		
OF9	1	13.428501	13.428501	0.0
	2	13.428501		
	3	13.428501		

Lampiran 5.6 Tabel Hasil Evaluasi SPF Basis Krim

Formula	Replikasi	SPF	Rata-rata	SD
Basis Krim	1	-0.08212	-0.08056	0.002711
	2	-0.08212		
	3	-0.07743		
Basis Krim + Octylmethoxycinnamate	1	13.02945	13.04841	0.027259
	2	13.07965		
	3	13.03613		
Basis Krim + Niacinamide	1	1.120617	1.113824	0.006939
	2	1.106747		
	3	1.114108		

Lampiran 5.7 Tabel Hasil Pengamatan Organoleptis Formula Optimum

Formula	Parameter		
	Bentuk	Warna	Aroma
Optimum	Semi Padat	Putih	Berbau Khas

Lampiran 5.8 Tabel Hasil Evaluasi pH Formula Optimum

Formula	Replikasi	pH	Rata-rata	SD
Optimum	1	5.27	5.253333	0.015275
	2	5.24		
	3	5.25		

Lampiran 5.9 Tabel Hasil Evaluasi Viskositas Formula Optimum

Formula	Replikasi	Viskositas (cPs)	Rata-rata	SD
Optimum	1	30400	30400	400
	2	30000		
	3	30800		

Lampiran 5.10 Tabel Hasil Evaluasi SPF Formula Optimum

Formula	Replikasi	SPF	Rata-rata	SD
Basis Krim	1	13.13837	13.14284	0.020948
	2	13.12448		
	3	13.16566		

Lampiran 5.11 Tabel Hasil Evaluasi SPF Sediaan X

Formula	Replikasi	SPF	Rata-rata	SD
Basis Krim	1	13.02945	13.04841	0.027259
	2	13.07965		
	3	13.03613		

Lampiran 6 Perhitungan Nilai SPF

Lampiran 6.1 SPF Formula Optimasi

$$\begin{aligned}
 \text{SPF OF 1 Replikasi 1} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.167) + (0.0817 \times 1.219) + \\
 &\quad (0.2874 \times 1.260) + (0.3278 \times 1.205) + (0.1864 \times \\
 &\quad 1.169) + (0.0839 \times 1.147) + (0.0180 \times 1.125)) \\
 &= 10 \times (0.0175 + 0.0996 + 0.3621 + 0.3950 + 0.2179 \\
 &\quad + 0.0962 + 0.0203) \\
 &= 12.0861
 \end{aligned}$$

$$\begin{aligned}
 \text{SPF OF 1 Replikasi 2} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.070) + (0.0817 \times 1.142) + \\
 &\quad (0.2874 \times 1.189) + (0.3278 \times 1.142) + (0.1864 \times \\
 &\quad 1.116) + (0.0839 \times 1.094) + (0.0180 \times 1.056)) \\
 &= 10 \times (0.0161 + 0.0933 + 0.3417 + 0.3743 + 0.2080 \\
 &\quad + 0.0918 + 0.0190) \\
 &= 11.4423
 \end{aligned}$$

$$\begin{aligned}
 \text{SPF OF 1 Replikasi 3} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.079) + (0.0817 \times 1.132) + \\
 &\quad (0.2874 \times 1.189) + (0.3278 \times 1.142) + (0.1864 \times \\
 &\quad 1.116) + (0.0839 \times 1.094) + (0.0180 \times 1.056)) \\
 &= 10 \times (0.0162 + 0.0925 + 0.3417 + 0.3743 + 0.2080 \\
 &\quad + 0.0918 + 0.0190) \\
 &= 11.4355
 \end{aligned}$$

$$\begin{aligned}
 \text{SPF OF 2 Replikasi 1} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.322) + (0.0817 \times 1.344) + \\
 &\quad (0.2874 \times 1.360) + (0.3278 \times 1.278) + (0.1864 \times \\
 &\quad 1.229) + (0.0839 \times 1.207) + (0.0180 \times 1.287)) \\
 &= 10 \times (0.0198 + 0.1098 + 0.3909 + 0.4189 + 0.2291 \\
 &\quad + 0.1013 + 0.0232) \\
 &= 12.9295
 \end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 2\ Replikasi\ 2 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.292) + (0.0817 \times 1.313) + \\
&\quad (0.2874 \times 1.344) + (0.3278 \times 1.263) + (0.1864 \times \\
&\quad 1.220) + (0.0839 \times 1.207) + (0.0180 \times 1.189)) \\
&= 10 \times (0.0194 + 0.1073 + 0.3863 + 0.4140 + 0.2274 \\
&\quad + 0.1013 + 0.0214) \\
&= 12.7701
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 2\ Replikasi\ 3 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.292) + (0.0817 \times 1.313) + \\
&\quad (0.2874 \times 1.344) + (0.3278 \times 1.263) + (0.1864 \times \\
&\quad 1.213) + (0.0839 \times 1.207) + (0.0180 \times 1.189)) \\
&= 10 \times (0.0194 + 0.1073 + 0.3863 + 0.4140 + 0.2261 \\
&\quad + 0.1013 + 0.0214) \\
&= 12.7510
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 3\ Replikasi\ 1 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.354) + (0.0817 \times 1.361) + \\
&\quad (0.2874 \times 1.376) + (0.3278 \times 1.295) + (0.1864 \times \\
&\quad 1.246) + (0.0839 \times 1.223) + (0.0180 \times 1.226)) \\
&= 10 \times (0.0203 + 0.1112 + 0.3955 + 0.4245 + 0.2323 \\
&\quad + 0.1026 + 0.0221) \\
&= 13.0840
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 3\ Replikasi\ 2 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.354) + (0.0817 \times 1.361) + \\
&\quad (0.2874 \times 1.376) + (0.3278 \times 1.295) + (0.1864 \times \\
&\quad 1.246) + (0.0839 \times 1.223) + (0.0180 \times 1.226)) \\
&= 10 \times (0.0203 + 0.1112 + 0.3955 + 0.4245 + 0.2323 \\
&\quad + 0.1026 + 0.0221) \\
&= 13.0840
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 3\ Replikasi\ 3 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.354) + (0.0817 \times 1.361) + \\
&\quad (0.2874 \times 1.376) + (0.3278 \times 1.295) + (0.1864 \times \\
&\quad 1.246) + (0.0839 \times 1.223) + (0.0180 \times 1.226)) \\
&= 10 \times (0.0203 + 0.1112 + 0.3955 + 0.4245 + 0.2323 \\
&\quad + 0.1026 + 0.0221) \\
&= 13.0840
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 4\ Replikasi\ 1 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.07) + (0.0817 \times 1.272) + (0.2874 \\
&\quad \times 1.300) + (0.3278 \times 1.232) + (0.1864 \times 1.196) + \\
&\quad (0.0839 \times 1.176) + (0.0180 \times 1.156)) \\
&= 10 \times (0.0161 + 0.1039 + 0.3736 + 0.4038 + 0.2229 \\
&\quad + 0.0987 + 0.0208) \\
&= 12.3985
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 4\ Replikasi\ 2 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.213) + (0.0817 \times 1.270) + \\
&\quad (0.2874 \times 1.300) + (0.3278 \times 1.232) + (0.1864 \times \\
&\quad 1.196) + (0.0839 \times 1.176) + (0.0180 \times 1.156)) \\
&= 10 \times (0.0182 + 0.1038 + 0.3736 + 0.4038 + 0.2229 \\
&\quad + 0.0987 + 0.0208) \\
&= 12.4283
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 4\ Replikasi\ 3 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.213) + (0.0817 \times 1.270) + \\
&\quad (0.2874 \times 1.300) + (0.3278 \times 1.232) + (0.1864 \times \\
&\quad 1.196) + (0.0839 \times 1.176) + (0.0180 \times 1.156)) \\
&= 10 \times (0.0182 + 0.1038 + 0.3736 + 0.4038 + 0.2229 \\
&\quad + 0.0987 + 0.0208) \\
&= 12.4283
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 5\ Replikasi\ 1 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.371) + (0.0817 \times 1.378) + \\
&\quad (0.2874 \times 1.383) + (0.3278 \times 1.330) + (0.1864 \times \\
&\quad 1.280) + (0.0839 \times 1.258) + (0.0180 \times 1.226)) \\
&= 10 \times (0.0206 + 0.1126 + 0.3975 + 0.4360 + 0.2386 \\
&\quad + 0.1055 + 0.0221) \\
&= 13.3280
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 5\ Replikasi\ 2 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.322) + (0.0817 \times 1.344) + \\
&\quad (0.2874 \times 1.360) + (0.3278 \times 1.295) + (0.1864 \times \\
&\quad 1.246) + (0.0839 \times 1.223) + (0.0180 \times 1.226)) \\
&= 10 \times (0.0198 + 0.1098 + 0.3909 + 0.4245 + 0.2323 \\
&\quad + 0.1026 + 0.0221) \\
&= 13.0193
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 5\ Replikasi\ 3 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.371) + (0.0817 \times 1.378) + \\
&\quad (0.2874 \times 1.411) + (0.3278 \times 1.330) + (0.1864 \times \\
&\quad 1.280) + (0.0839 \times 1.258) + (0.0180 \times 1.226)) \\
&= 10 \times (0.0206 + 0.1126 + 0.4055 + 0.4360 + 0.2386 \\
&\quad + 0.1055 + 0.0221) \\
&= 13.4085
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 6\ Replikasi\ 1 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.371) + (0.0817 \times 1.378) + \\
&\quad (0.2874 \times 1.393) + (0.3278 \times 1.312) + (0.1864 \times \\
&\quad 1.263) + (0.0839 \times 1.240) + (0.0180 \times 1.245)) \\
&= 10 \times (0.0206 + 0.1126 + 0.4003 + 0.4301 + 0.2354 \\
&\quad + 0.011440 + 0.0224) \\
&= 13.2544
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 6\ Replikasi\ 2 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.371) + (0.0817 \times 1.378) + \\
&\quad (0.2874 \times 1.393) + (0.3278 \times 1.312) + (0.1864 \times \\
&\quad 1.263) + (0.0839 \times 1.240) + (0.0180 \times 1.245)) \\
&= 10 \times (0.0206 + 0.1126 + 0.4003 + 0.4301 + 0.2354 \\
&\quad + 0.011440 + 0.0224) \\
&= 13.2544
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 6\ Replikasi\ 3 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.371) + (0.0817 \times 1.378) + \\
&\quad (0.2874 \times 1.393) + (0.3278 \times 1.312) + (0.1864 \times \\
&\quad 1.263) + (0.0839 \times 1.240) + (0.0180 \times 1.245)) \\
&= 10 \times (0.0206 + 0.1126 + 0.4003 + 0.4301 + 0.2354 \\
&\quad + 0.011440 + 0.0224) \\
&= 13.2544
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 7\ Replikasi\ 1 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.251) + (0.0817 \times 1.299) + \\
&\quad (0.2874 \times 1.314) + (0.3278 \times 1.263) + (0.1864 \times \\
&\quad 1.229) + (0.0839 \times 1.207) + (0.0180 \times 1.172)) \\
&= 10 \times (0.0188 + 0.1061 + 0.3776 + 0.4140 + 0.2291 \\
&\quad + 0.1013 + 0.0221) \\
&= 12.6800
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 7\ Replikasi\ 2 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.167) + (0.0817 \times 1.232) + \\
&\quad (0.2874 \times 1.260) + (0.3278 \times 1.218) + (0.1864 \times \\
&\quad 1.169) + (0.0839 \times 1.161) + (0.0180 \times 1.155)) \\
&= 10 \times (0.0175 + 0.1007 + 0.3621 + 0.3993 + 0.2179 \\
&\quad + 0.0974 + 0.0208) \\
&= 12.1564
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 7\ Replikasi\ 3 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.251) + (0.0817 \times 1.284) + \\
&\quad (0.2874 \times 1.329) + (0.3278 \times 1.263) + (0.1864 \times \\
&\quad 1.213) + (0.0839 \times 1.191) + (0.0180 \times 1.172)) \\
&= 10 \times (0.0188 + 0.1049 + 0.3820 + 0.4140 + 0.2261 \\
&\quad + 0.0999 + 0.0211) \\
&= 12.6676
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 8\ Replikasi\ 1 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.338) + (0.0817 \times 1.361) + \\
&\quad (0.2874 \times 1.376) + (0.3278 \times 1.312) + (0.1864 \times \\
&\quad 1.263) + (0.0839 \times 1.240) + (0.0180 \times 1.226)) \\
&= 10 \times (0.0201 + 0.1112 + 0.3955 + 0.4301 + 0.2354 \\
&\quad + 0.1040 + 0.0221) \\
&= 13.1833
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 8\ Replikasi\ 2 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.322) + (0.0817 \times 1.344) + \\
&\quad (0.2874 \times 1.376) + (0.3278 \times 1.295) + (0.1864 \times \\
&\quad 1.246) + (0.0839 \times 1.240) + (0.0180 \times 1.226)) \\
&= 10 \times (0.0198 + 0.1098 + 0.3955 + 0.4245 + 0.2323 \\
&\quad + 0.1040 + 0.0221) \\
&= 13.0796
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 8\ Replikasi\ 3 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.338) + (0.0817 \times 1.361) + \\
&\quad (0.2874 \times 1.393) + (0.3278 \times 1.312) + (0.1864 \times \\
&\quad 1.263) + (0.0839 \times 1.240) + (0.0180 \times 1.226)) \\
&= 10 \times (0.0201 + 0.1112 + 0.4003 + 0.4301 + 0.2354 \\
&\quad + 0.1040 + 0.0221) \\
&= 13.2321
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 9\ Replikasi\ 1 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.389) + (0.0817 \times 1.395) + \\
&\quad (0.2874 \times 1.411) + (0.3278 \times 1.330) + (0.1864 \times \\
&\quad 1.280) + (0.0839 \times 1.258) + (0.0180 \times 1.245)) \\
&= 10 \times (0.0208 + 0.1140 + 0.4055 + 0.4360 + 0.2386 \\
&\quad + 0.1055 + 0.0224) \\
&= 13.4285
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 9\ Replikasi\ 2 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.389) + (0.0817 \times 1.395) + \\
&\quad (0.2874 \times 1.411) + (0.3278 \times 1.330) + (0.1864 \times \\
&\quad 1.280) + (0.0839 \times 1.258) + (0.0180 \times 1.245)) \\
&= 10 \times (0.0208 + 0.1140 + 0.4055 + 0.4360 + 0.2386 \\
&\quad + 0.1055 + 0.0224) \\
&= 13.4285
\end{aligned}$$

$$\begin{aligned}
SPF\ OF\ 9\ Replikasi\ 3 &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda) \\
&= 10 \times ((0.0150 \times 1.389) + (0.0817 \times 1.395) + \\
&\quad (0.2874 \times 1.411) + (0.3278 \times 1.330) + (0.1864 \times \\
&\quad 1.280) + (0.0839 \times 1.258) + (0.0180 \times 1.245)) \\
&= 10 \times (0.0208 + 0.1140 + 0.4055 + 0.4360 + 0.2386 \\
&\quad + 0.1055 + 0.0224) \\
&= 13.4285
\end{aligned}$$

Lampiran 6.2 SPF Basis Krim + Octylmethoxycinnamate

$$\begin{aligned}
 \text{SPF replikasi 1} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.345) + (0.0817 \times 1.353) + (0.2874 \\
 &\quad \times 1.368) + (0.3278 \times 1.286) + (0.1864 \times 1.252) + \\
 &\quad (0.0839 \times 1.231) + (0.0180 \times 1.159)) \\
 &= 10 \times (0.0202 + 0.1105 + 0.3932 + 0.4261 + 0.2334 \\
 &\quad + 0.1033 + 0.0209) \\
 &= 13.0294
 \end{aligned}$$

$$\begin{aligned}
 \text{SPF replikasi 2} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.330) + (0.0817 \times 1.353) + \\
 &\quad (0.2874 \times 1.368) + (0.3278 \times 1.302) + (0.1864 \times \\
 &\quad 1.252) + (0.0839 \times 1.231) + (0.0180 \times 1.159)) \\
 &= 10 \times (0.0200 + 0.1105 + 0.3932 + 0.4268 + 0.2334 \\
 &\quad + 0.1033 + 0.0209) \\
 &= 13.0796
 \end{aligned}$$

$$\begin{aligned}
 \text{SPF replikasi 3} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.350) + (0.0817 \times 1.347) + (0.2874 \\
 &\quad \times 1.368) + (0.3278 \times 1.290) + (0.1864 \times 1.252) + \\
 &\quad (0.0839 \times 1.230) + (0.0180 \times 1.151)) \\
 &= 10 \times (0.02203 + 0.1100 + 0.3932 + 0.4229 + \\
 &\quad 0.2334 + 0.1032 + 0.0207) \\
 &= 13.0361
 \end{aligned}$$

Lampiran 6.3 SPF Basis Krim + Niacinamide

$$\begin{aligned}
 \text{SPF replikasi 1} &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 0.102) + (0.0817 \times 0.100) + \\
 &\quad (0.2874 \times 0.107) + (0.3278 \times 0.115) + (0.1864 \times \\
 &\quad 0.121) + (0.0839 \times 0.115) + (0.0180 \times 0.095)) \\
 &= 10 \times (0.0015 + 0.0082 + 0.0308 + 0.0377 + 0.0226 \\
 &\quad + 0.0096 + 0.0017) \\
 &= 1.1206
 \end{aligned}$$

$$\begin{aligned}
 \text{SPF replikasi 2} &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 0.102) + (0.0817 \times 0.099) + \\
 &\quad (0.2874 \times 0.105) + (0.3278 \times 0.114) + (0.1864 \times \\
 &\quad 0.119) + (0.0839 \times 0.114) + (0.0180 \times 0.098)) \\
 &= 10 \times (0.0015 + 0.0081 + 0.0302 + 0.0374 + 0.0222 \\
 &\quad + 0.0096 + 0.0018) \\
 &= 1.1067
 \end{aligned}$$

$$\begin{aligned}
 \text{SPF replikasi 3} &= FK \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 0.103) + (0.0817 \times 0.101) + \\
 &\quad (0.2874 \times 0.106) + (0.3278 \times 0.114) + (0.1864 \times \\
 &\quad 0.120) + (0.0839 \times 0.115) + (0.0180 \times 0.098)) \\
 &= 10 \times (0.0015 + 0.0083 + 0.0305 + 0.0374 + 0.0224 \\
 &\quad + 0.0096 + 0.0018) \\
 &= 1.141
 \end{aligned}$$

Lampiran 6.4 SPF Formula Optimum

$$\begin{aligned}
 \text{SPF replikasi 1} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.344) + (0.0817 \times 1.348) + \\
 &\quad (0.2874 \times 1.377) + (0.3278 \times 1.305) + (0.1864 \times \\
 &\quad 1.259) + (0.0839 \times 1.236) + (0.0180 \times 1.125)) \\
 &= 10 \times (0.0202 + 0.1101 + 0.3957 + 0.4278 + 0.2347 \\
 &\quad + 0.1037 + 0.0203) \\
 &= 13.1245
 \end{aligned}$$

$$\begin{aligned}
 \text{SPF replikasi 2} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.344) + (0.0817 \times 1.365) + \\
 &\quad (0.2874 \times 1.377) + (0.3278 \times 1.305) + (0.1864 \times \\
 &\quad 1.259) + (0.0839 \times 1.236) + (0.0180 \times 1.125)) \\
 &= 10 \times (0.0202 + 0.1115 + 0.3957 + 0.4278 + 0.2347 \\
 &\quad + 0.1037 + 0.0203) \\
 &= 13.1384
 \end{aligned}$$

$$\begin{aligned}
 \text{SPF replikasi 3} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.380) + (0.0817 \times 1.385) + \\
 &\quad (0.2874 \times 1.376) + (0.3278 \times 1.307) + (0.1864 \times \\
 &\quad 1.260) + (0.0839 \times 1.236) + (0.0180 \times 1.125)) \\
 &= 10 \times (0.0207 + 0.1132 + 0.3955 + 0.4284 + 0.2349 \\
 &\quad + 0.1037 + 0.0203) \\
 &= 13.1657
 \end{aligned}$$

Lampiran 6.5 SPF Sedian X

$$\begin{aligned}
 \text{SPF replikasi 1} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.330) + (0.0817 \times 1.353) + \\
 &\quad (0.2874 \times 1.368) + (0.3278 \times 1.302) + (0.1864 \times \\
 &\quad 1.252) + (0.0839 \times 1.231) + (0.0180 \times 1.159)) \\
 &= 10 \times (0.0200 + 0.1105 + 0.3932 + 0.4268 + 0.2334 \\
 &\quad + 0.1033 + 0.0209) \\
 &= 13.40796
 \end{aligned}$$

$$\begin{aligned}
 \text{SPF replikasi 2} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.345) + (0.0817 \times 1.353) + \\
 &\quad (0.2874 \times 1.368) + (0.3278 \times 1.286) + (0.1864 \times \\
 &\quad 1.252) + (0.0839 \times 1.231) + (0.0180 \times 1.159)) \\
 &= 10 \times (0.0202 + 0.1105 + 0.3932 + 0.4216 + 0.2334 \\
 &\quad + 0.1033 + 0.0209) \\
 &= 11.0249
 \end{aligned}$$

$$\begin{aligned}
 \text{SPF replikasi 3} &= \text{FK} \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times \text{Abs}(\lambda) \\
 &= 10 \times ((0.0150 \times 1.350) + (0.0817 \times 1.347) + \\
 &\quad (0.2874 \times 1.368) + (0.3278 \times 1.290) + (0.1864 \times \\
 &\quad 1.252) + (0.0839 \times 1.230) + (0.0180 \times 1.151)) \\
 &= 10 \times (0.0203 + 0.1100 + 0.3932 + 0.4229 + 0.2334 \\
 &\quad + 0.1032 + 0.0207) \\
 &= 13.0361
 \end{aligned}$$

Lampiran 7 Data Hasil Analisis Statistika

Lampiran 7.1 pH

NPar Tests**One-Sample Kolmogorov-Smirnov Test**

		pH
N		12
Normal Parameters ^{a,b}	Mean	5.7058
	Std. Deviation	.19181
Most Extreme Differences	Absolute	.258
	Positive	.250
	Negative	-.258
Test Statistic		.258
Asymp. Sig. (2-tailed)		.027 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Kruskal-Wallis Test**Ranks**

	Formula_Dasar	N	Mean Rank
pH	F1	3	11.00
	F2	3	5.33
	F3	3	5.83
	F4	3	3.83
	Total	12	

Test Statistics^{a,b}

	pH
Chi-Square	6.778
df	3
Asymp. Sig.	.079

a. Kruskal Wallis Test

b. Grouping Variable:

Formula_Dasar

Lampiran 7.2 Viskositas

NPar Tests**One-Sample Kolmogorov-Smirnov Test**

		Viskositas
N		12
Normal Parameters ^{a,b}	Mean	44700.00
	Std. Deviation	12386.650
Most Extreme Differences	Absolute	.217
	Positive	.217
	Negative	-.182
Test Statistic		.217
Asymp. Sig. (2-tailed)		.125 ^c

- a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

Oneway**ANOVA**

Viskositas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1670760000.000	3	556920000.000	262.698	.000
Within Groups	16960000.000	8	2120000.000		
Total	1687720000.000	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Viskositas

Tukey HSD

(I) Formula_Dasar	(J) Formula_Da sar	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
F1	F2	-12000.000*	1188.837	.000	-15807.07	-8192.93
	F3	-30000.000*	1188.837	.000	-33807.07	-26192.93
	F4	-2400.000	1188.837	.258	-6207.07	1407.07
F2	F1	12000.000*	1188.837	.000	8192.93	15807.07
	F3	-18000.000*	1188.837	.000	-21807.07	-14192.93
	F4	9600.000*	1188.837	.000	5792.93	13407.07
F3	F1	30000.000*	1188.837	.000	26192.93	33807.07
	F2	18000.000*	1188.837	.000	14192.93	21807.07
	F4	27600.000*	1188.837	.000	23792.93	31407.07
F4	F1	2400.000	1188.837	.258	-1407.07	6207.07
	F2	-9600.000*	1188.837	.000	-13407.07	-5792.93
	F3	-27600.000*	1188.837	.000	-31407.07	-23792.93

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

Homogeneous Subsets

Viskositas

Tukey HSD^a

Formula_Dasar	N	Subset for alpha = 0.05		
		1	2	3
F1	3	33600.00		
F4	3	36000.00		
F2	3		45600.00	
F3	3			63600.00
Sig.		.258	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

Lampiran 7.3 SPF

NPar Tests**One-Sample Kolmogorov-Smirnov Test**

		SPF
N		6
Normal Parameters ^{a,b}	Mean	13.0956
	Std. Deviation	.05611
Most Extreme Differences	Absolute	.197
	Positive	.189
	Negative	-.197
Test Statistic		.197
Asymp. Sig. (2-tailed)		.200 ^{c,d}

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

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

T-Test**Group Statistics**

	Formula	N	Mean	Std. Deviation	Std. Error Mean
SPF	Formula optimum	3	13.1428	.02095	.01209
	Sediaan X	3	13.0484	.02726	.01574

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
SPF	Equal variances assumed	.513	.513	4.758	4	.009	.09443	.01985	.03932	.14954
	Equal variances not assumed			4.758	3.751	.010	.09443	.01985	.03785	.15101