

DAFTAR PUSTAKA

Amir Husni, S. A. B. (2021) 'Rumput laut sebagai sumber pangan kesehatan dan kosmetik', *Jurnal Pangan dan Agroindustri*.

Baumann, L., dan Alleman, I.N., 2009, *Cosmetic Dermatology Principles and Practice*, 2nd, McGraw-Hill, New York.

Draelos, Z. D., & Thaman, L. A., 2006, 157-159, *Cosmetic Formulation of Skin Care Products*, Taylor and Francis Group, New York.

Dutra, E.A., Oliveira, D.A., Kedorhackman, E.R., & Santoro, M.I. 2004. Determination of Sun Protection Factor (SPF) of Sunscreen by Ultraviolet Spectrophotometry. *Brazilian Journal of Pharmaceutical Sciences*, 40, 381-385.

Gandjar, I. & R. (2007) 'Kimia Farmasi Analisis', *Penerbit Pustaka Pelajar. Yogyakarta.*, pp. 229–318. doi: 10.3390/cosmetics2020066.

Jumsurizal *et al.* (2019) 'Formulasi Krim Tabir Surya dari Rumput Laut dengan berbagai Jenis Tipe Krim', *Jurnal Perikanan dan Kelautan*, 9(2), pp. 174–184.

Keyong Ho Lee., Sang woo Bae., C.-H. C. and K. H. R. (2009) 'Fucoidan Protects Human Skin Fibroblast Cell Line HS68 Against γ - Radiation-Induced Damage. Korea Institute of radiological and Medical sciences of Modulation of Radiobiological responses'.

Kim, Y. I., Oh, W. S., Song, P. H., Yun, S., Kwon, Y. S., Lee, Y. J., Ku, S. K., Song, C. H., & Oh, T. H. (2018). *Anti-photoaging effects of low molecular-weight fucoidan on ultraviolet B-irradiated mice*. *Marine Drugs*, 16(8), 286.

Marzuki, A., & Pakki, E. (2017). Stabilitas Fisik Sediaan Krim Ekstrak Etanol Kulit Batang Banyuru (*Pterospermum celebicum* Miq.) Dengan Variasi Phytocream®. *Proceeding of the 5 Th Mulawarman Pharmaceuticals Conferences*.

Mbanga, L, Mulenga, M, Mpiana, Bokolo, K, Mubwa, M & Mvingu, K. (2014) 'Determination of Sun Protection Factor (SPF) of Some Body Creams and Lotions Marketed in Kinshasa by Ultraviolet Spectrophotometry', *International Journal of Advanced Research in Chemical Science (IJARCS)*, pp. 7–13.

Minerva, P (2019), 'Penggunaan Tabir Surya Bagi Kesehatan Kulit'. Program Studi Pendidikan Tata Rias dan Kecantikan. Fakultas Pariwisata dan Perhotelan Universitas Negeri Padang. Sumatera Barat.

Nur aisyah, A., Yusuf, N. A., Ismail, & Hasliah. (2017). *Pengaruh Variasi Konsentrasi Emulgator Phytocream® Terhadap Kestabilan Fisik Formula Krim Ekstrak Etanol Daun Kelor (Moringa oleifera L.) Dalam Menghambat Propionibacterium acnes*. Pendidikan Farmasi Dan Apoteker Yang Paripurna Untuk Mencapai Kompetensi Dalam Menghadapi Persaingan Global, 29.

OECD. (2015). Test NO. 404 : ACute Dermal Irritation/Corrosion. OECD Publishing.

Purwaningsih, S., Salamah, E. and Adnin, M. N. (2015) 'PHOTOPROTECTIVE EFFECT OF SUNSCREEN CREAM WITH ADDITION OF CARRAGEENAN AND BLACK MANGROVE FRUIT (*Rhizophora mucronata* Lamk.)', *Jurnal Ilmu dan Teknologi Kelautan Tropis*, 7(1), pp. 1–14. doi: 10.29244/jitkt.v7i1.9819.

Rähse, W. 2020. *Cosmetic Creams: Development, Manufacture and Marketing of Effective Skin Care Products*. Wiley-VCH. Weinheim, Germany

Samee H, Li ZH, Lin H, Khalid J, Guo YC. (2009). Antiallergic effects of ethanol extracts from brown seaweeds. *Journal of Zhejiang. University Science B* 10(2):147 – 153.

Sinerga, S.p.A. 2015, Phytocream 2000® Vegetable Origin Emulsifier system for O/W Emulsions, *Direzione, Uffici, Centro Ricerca e Unità Produttiva Via Della Paciarna, 67-21050 Gorla Maggiore (VA) : Italia*

Sumardjo, D. (2006) *Pengantar Kimia, Buku Panduan Kuliah Mahasiswa Kedokteran dan Program Strata I Fakultas Bioeksata. Jakarta: EGC*. doi: 10.34147/crj.v3i01.46.

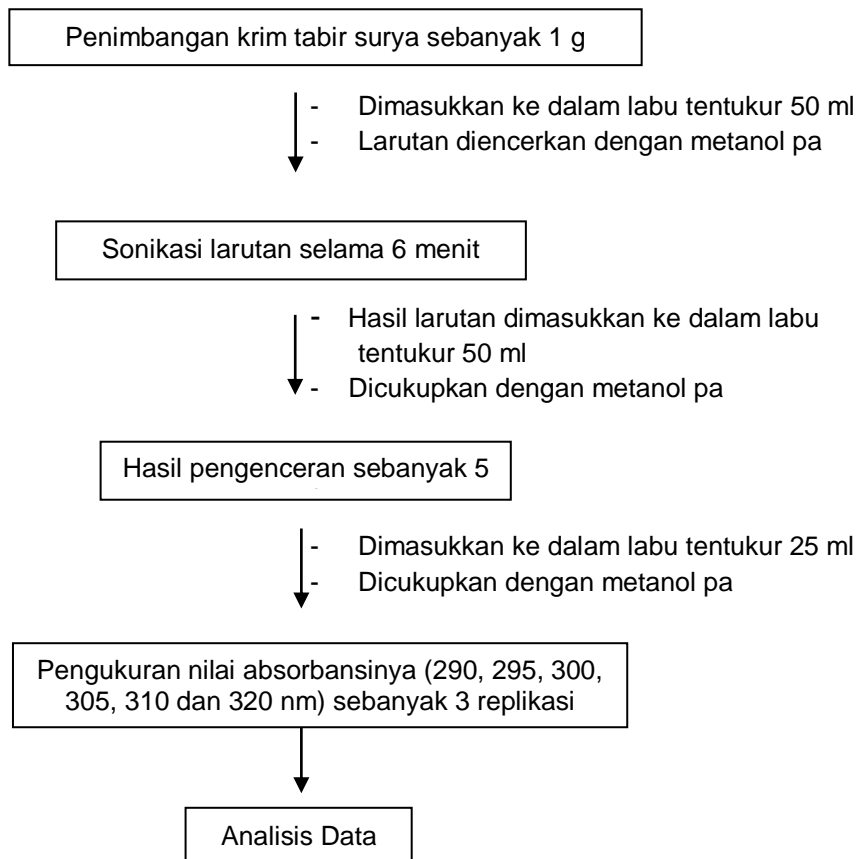
Syarif, M. W. (2011) *Dermatologi Kosmetik, Edisi ke-2. FK UI. Jakarta*.

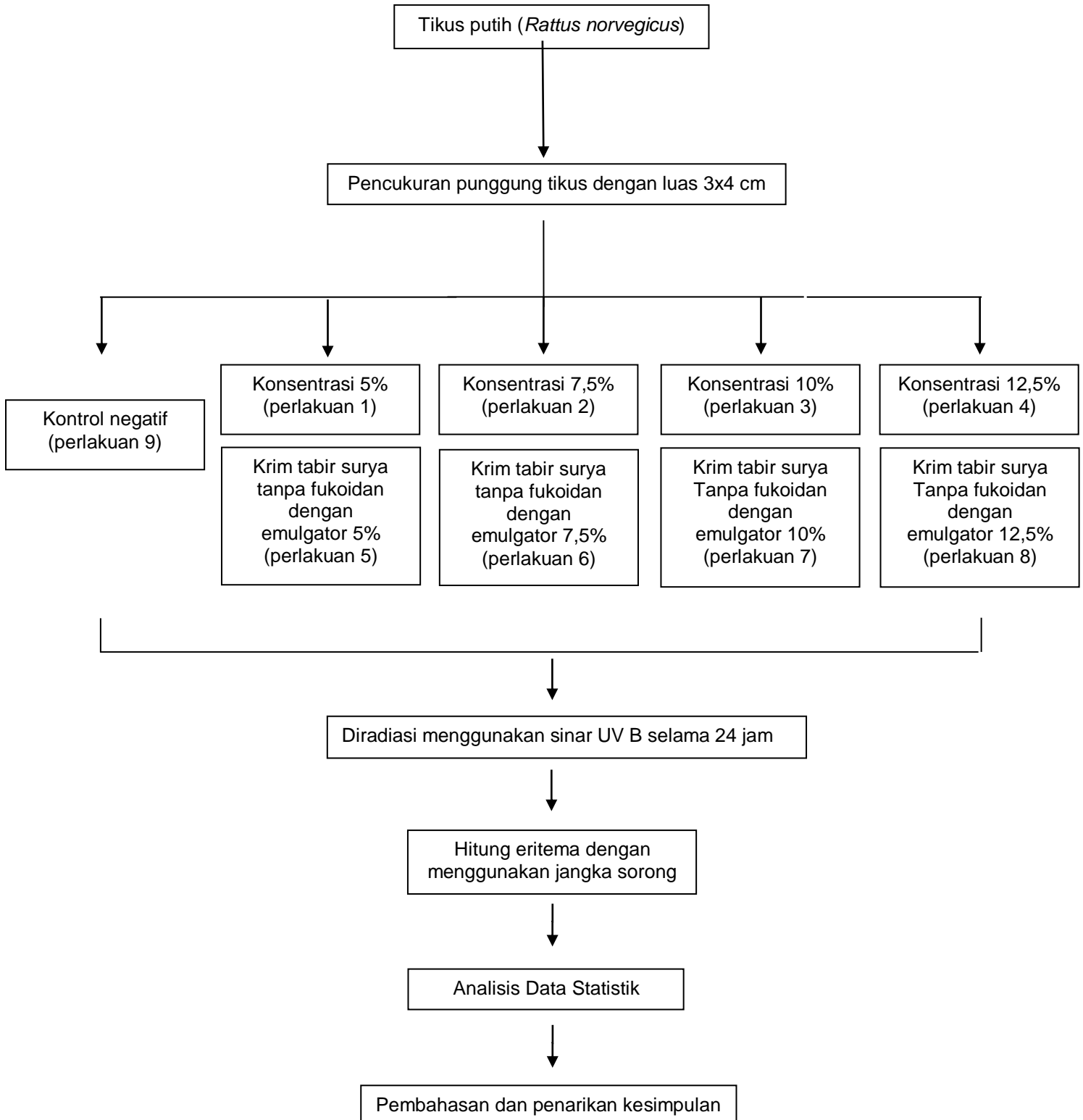
Soeratri, W. (2001). *Studi Proteksi Radiasi UV Sinar Matahari Tahap 1 : Studi Efektivitas Protetor Kimia*. Lembaga Penelitian Universitas Airlangga Surabaya.

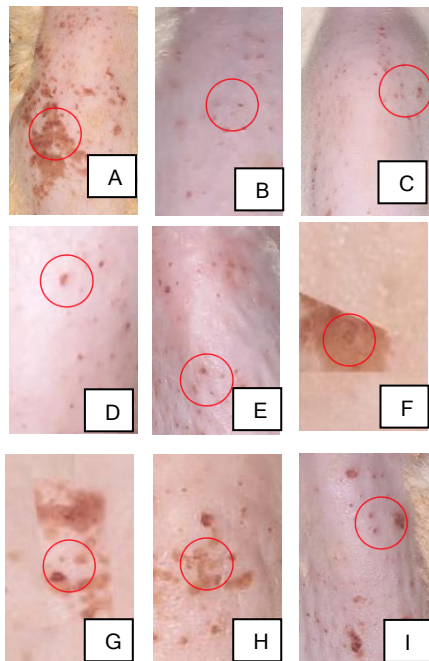
Yulianti, E., Adelsa, A. and Putri, A. (2015) 'The Determination of SPF (Sun Protection Factor) Cream In Vitro using Spektrofotometry Method', *Majalah Kesehatan FKUB*, 2, pp. 41–50.


LAMPIRAN

Lampiran 1 Uji Aktivitas Perlindungan Tabir Surya secara *In Vitro*



Lampiran 2 Uji Aktivitas Perlindungan Tabir Surya secara *In Vivo*

Lampiran 3 Gambar Penelitian Uji Perlindungan Tabir Surya Secara *In Vivo***Keterangan :**

- A : Kontrol negatif  : Eritema
- B : Emulgator 5% dengan fukoidan
- C : Emulgator 7,5% dengan fukoidan
- D : Emulgator 10% dengan fukoidan
- E : Emulgator 12,5% dengan fukoidan
- F : Emulgator 5% tanpa fukoidan
- G : Emulgator 7,5% tanpa fukoidan
- H : Emulgator 10% tanpa fukoidan
- I : Emulgator 12,5% tanpa fukoidan

Lampiran 4 Gambar Penelitian Uji Aktivitas Perlindungan Tabir Surya Secara *In Vitro*

Lampiran 5 Tabel Hasil Evaluasi Uji Aktivitas Perlindungan Tabir Surya secara In Vivo

Jenis Krim	Nilai Eritema			Diameter Eritema (mm)			Rata-Rata		SD	
	Replikasi						Nilai Eritema	Diameter Eritema (mm)	Nilai Eritema	Diameter Eritema (mm)
	1	2	3	1	2	3				
Emulgator 5% dengan fukoidan	1	1	1	25	25	25	1	25	0	0
Emulgator 7,5% dengan fukoidan	1	1	0	25.6	25	0	0.67	16.67	0.57	14.61
Emulgator 10% dengan fukoidan	1	0	1	25	0	25	0.67	16.66	0.57	14.43
Emulgator 12,5% dengan fukoidan	1	0	0	25	0	0	0.33	8.33	0.57	14.43
Emulgator 5% tanpa fukoidan	3	1	1	32	25	25	1.67	27.33	1.15	4.04
Emulgator 7,5% tanpa fukoidan	2	1	1	28	25	25	1.33	26	0.57	1.73
Emulgator 10% tanpa fukoidan	2	1	0	26	25	0	1	17	1	14.73
Emulgator 12,5% tanpa fukoidan	1	1	0	25.8	25	0	0.67	6.35	0.57	14.67
Kontrol Negatif	3	2	2	35	30	28	2.33	31	0.57	3.60

Ket Nilai Eritema :**0 = Tanpa eritema****1 = Sangat sedikit eritema****2 = Eritema jelas terlihat****3 = Eritema sedang****4 = Eritema berat**

Lampiran 6 Tabel Hasil Evaluasi Uji Aktivitas Perlindungan Tabir Surya secara *In Vitro*

Formula	Replikasi	SPF	Rata-rata	SD
F1	1	10.445	10.814	0.979
	2	11.925		
	3	10.073		
F2	1	9.689	10.855	1.013
	2	11.532		
	3	11.343		
F3	1	11.162	11.145	0.590
	2	10.546		
	3	11.727		
F4	1	10.856	11.178	0.399
	2	11.054		
	3	11.625		

Lampiran 7 Perhitungan Nilai SPF

$$\begin{aligned}
\text{SPF F1} &= \text{FK} \times \sum_{290}^{320} \text{EE}(\lambda) \times l(\lambda) \times \text{Abs}(\lambda) \\
&= 10 \times ((0.0150 \times 0.43333) + (0.0817 \times 0.83333) + (0.2874 \times 1.36667) + (0.3278 \times 1.01667) + (0.1864 \times 1.00000) + \\
&\quad (0.0839 \times 0.95000) + (0.0180 \times 0.81667)) \\
&= 10 \times (0.00650 + 0.06808 + 0.39278 + 0.33326 + 0.18640 + \\
&\quad 0.07971 + 0.01470) \\
&= 10.81432
\end{aligned}$$

$$\begin{aligned}
\text{SPF F2} &= \text{FK} \times \sum_{290}^{320} \text{EE}(\lambda) \times l(\lambda) \times \text{Abs}(\lambda) \\
&= 10 \times ((0.0150 \times 0.78333) + (0.0817 \times 0.68333) + (0.2874 \times 1.31667) + (0.3278 \times 1.01667) + (0.1864 \times 1.05000) + \\
&\quad (0.0839 \times 1.06667) + (0.0180 \times 1.16667)) \\
&= 10 \times (0.01175 + 0.05583 + 0.37841 + 0.33326 + 0.19572 + \\
&\quad 0.08949 + 0.02100) \\
&= 10.85565
\end{aligned}$$

$$\begin{aligned}
\text{SPF F3} &= \text{FK} \times \sum_{290}^{320} \text{EE}(\lambda) \times l(\lambda) \times \text{Abs}(\lambda) \\
&= 10 \times ((0.0150 \times 0.60000) + (0.0817 \times 0.95000) + (0.2874 \times 1.11667) + (0.3278 \times 1.10000) + (0.1864 \times 1.21667) + \\
&\quad (0.0839 \times 1.15000) + (0.0180 \times 1.28333)) \\
&= 10 \times (0.00900 + 0.07762 + 0.32093 + 0.36058 + 0.22679 + \\
&\quad 0.09649 + 0.02310) \\
&= 11.14597
\end{aligned}$$

$$\begin{aligned}
\text{SPF F4} &= \text{FK} \times \sum_{290}^{320} \text{EE}(\lambda) \times l(\lambda) \times \text{Abs}(\lambda) \\
&= 10 \times ((0.0150 \times 0.78333) + (0.0817 \times 0.83333) + (0.2874 \times 1.28333) + (0.3278 \times 1.03333) + (0.1864 \times 1.11667) + \\
&\quad (0.0839 \times 1.15000) + (0.0180 \times 1.43333)) \\
&= 10 \times (0.01175 + 0.06808 + 0.36883 + 0.33873 + 0.20815 + \\
&\quad 0.09649 + 0.02580) \\
&= 11.17822
\end{aligned}$$

Lampiran 8 Data Nilai Hasil Statistika

Lampiran 8.1 Uji Aktivitas Perlindungan Tabir Surya Secara *In Vitro*

Tests of Normality

	Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	df	Sig.
Nilai SPF	Formula 1	,314	3	.	,893	3	,365
	Formula 2	,352	3	.	,826	3	,178
	Formula 3	,178	3	.	,999	3	,952
	Formula 4	,289	3	.	,927	3	,479

a. Lilliefors Significance Correction

ANOVA

Nilai SPF

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	,325	3	,108	,174	,911
Within Groups	4,992	8	,624		
Total	5,317	11			

Multiple Comparisons

Dependent Variable: Nilai SPF

Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Formula 1	Formula 2	-,040333	,644998	1,000	-2,10584	2,02518
	Formula 3	-,330667	,644998	,954	-2,39618	1,73484
	Formula 4	-,364000	,644998	,940	-2,42951	1,70151
Formula 2	Formula 1	,040333	,644998	1,000	-2,02518	2,10584
	Formula 3	-,290333	,644998	,968	-2,35584	1,77518
	Formula 4	-,323667	,644998	,956	-2,38918	1,74184
Formula 3	Formula 1	,330667	,644998	,954	-1,73484	2,39618
	Formula 2	,290333	,644998	,968	-1,77518	2,35584
	Formula 4	-,033333	,644998	1,000	-2,09884	2,03218
Formula 4	Formula 1	,364000	,644998	,940	-1,70151	2,42951
	Formula 2	,323667	,644998	,956	-1,74184	2,38918
	Formula 3	,033333	,644998	1,000	-2,03218	2,09884

Uji Homogenitas

Nilai SPF

Tukey HSD^a

Formula	N	Subset for alpha = 0.05
		1
Formula 1	3	10,81433
Formula 2	3	10,85467
Formula 3	3	11,14500
Formula 4	3	11,17833
Sig.		,940

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3,000.

Lampiran 8.2 Uji Aktivitas Perlindungan Tabir Surya Secara *In Vivo*

Uji Normalitas

Tests of Normality							
	Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Uji in Vivo	Formula 5% (ZA)	,385	3	.	,750	3	,000
	Formula 7,5% (ZA)	,385	3	.	,750	3	,000
	Formula 10% (ZA)	,385	3	.	,750	3	,000
	Formula 12,5% (ZA)	,385	3	.	,750	3	,000
	Formla 5% (Tanpa ZA)	,385	3	.	,750	3	,000
	Formula 7,5% (Tanpa ZA)	,385	3	.	,750	3	,000
	Formula 10% (Tanpa ZA)	,175	3	.	1,000	3	1,000
	Formula 12,5% (Tanpa ZA)	,385	3	.	,750	3	,000
	Kontrol Negatif	,385	3	.	,750	3	,000

a. Lilliefors Significance Correction

Uji Kruskal

Test Statistics ^{a,b}	
	Uji in Vivo
Chi-Square	14,300
Df	8
Asymp. Sig.	,074

a. Kruskal Wallis Test

b. Grouping Variable:

Formula

Uji lanjutan perbandingan antar formula
Formula 1 & 2 (Mann witney)

Test Statistics ^a	
	Uji in Vivo
Mann-Whitney U	4,500
Wilcoxon W	10,500
Z	,000
Asymp. Sig. (2-tailed)	1,000
Exact Sig. [2*(1-tailed Sig.)]	1,000 ^b

- a. Grouping Variable: Formula
b. Not corrected for ties.

Formula 1 & 3 (Mann witney)

Test Statistics ^a	
	Uji in Vivo
Mann-Whitney U	4,500
Wilcoxon W	10,500
Z	,000
Asymp. Sig. (2-tailed)	1,000
Exact Sig. [2*(1-tailed Sig.)]	1,000 ^b

- a. Grouping Variable: Formula
b. Not corrected for ties.

Formula 1 & 4 (Mann witney)

Test Statistics ^a	
	Uji in Vivo
Mann-Whitney U	4,500
Wilcoxon W	10,500
Z	,000
Asymp. Sig. (2-tailed)	1,000
Exact Sig. [2*(1-tailed Sig.)]	1,000 ^b

- a. Grouping Variable: Formula
b. Not corrected for ties.

Formula 1 & 5 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 1 & 6 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 1 & 7 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	2,500
Wilcoxon W	8,500
Z	-,943
Asymp. Sig. (2-tailed)	,346
Exact Sig. [2*(1-tailed Sig.)]	,400 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 1 & 8 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	3,000
Wilcoxon W	9,000
Z	-,745
Asymp. Sig. (2-tailed)	,456
Exact Sig. [2*(1-tailed Sig.)]	,700 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 1 & 9 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	,000
Wilcoxon W	6,000
Z	-2,023
Asymp. Sig. (2-tailed)	,043
Exact Sig. [2*(1-tailed Sig.)]	,100 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 2& 3 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	,000
Wilcoxon W	6,000
Z	-2,023
Asymp. Sig. (2-tailed)	,043
Exact Sig. [2*(1-tailed Sig.)]	,100 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 2 & 4 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	,000
Wilcoxon W	6,000
Z	-2,023
Asymp. Sig. (2-tailed)	,043
Exact Sig. [2*(1-tailed Sig.)]	,100 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 2 & 5 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	,000
Wilcoxon W	6,000
Z	-2,023
Asymp. Sig. (2-tailed)	,043
Exact Sig. [2*(1-tailed Sig.)]	,100 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 2 & 6 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 2 & 7 (Mann witney)

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 2 & 8 (Mann witney)

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Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 2& 9 (Mann witney)

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 3 & 4 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 3& 5 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 3 & 6 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

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	Uji in Vivo
Mann-Whitney U	1,000
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Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 3 & 8 (Mann witney)

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 3 & 9 (Mann witney)

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 4 & 5 (Mann witney)

Test Statistics ^a	
	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 4 & 6 (Mann witney)

Test Statistics ^a	
	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 4 & 7 (Mann witney)

Test Statistics ^a	
	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 4 & 8 (Mann witney)

	Uji in Vivo
Mann-Whitney U	3,000
Wilcoxon W	9,000
Z	-,745
Asymp. Sig. (2-tailed)	,456
Exact Sig. [2*(1-tailed Sig.)]	,700 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 4 & 9 (Mann witney)

	Uji in Vivo
Mann-Whitney U	3,000
Wilcoxon W	9,000
Z	-,745
Asymp. Sig. (2-tailed)	,456
Exact Sig. [2*(1-tailed Sig.)]	,700 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 5 & 6 (Mann witney)

	Uji in Vivo
Mann-Whitney U	3,000
Wilcoxon W	9,000
Z	-,745
Asymp. Sig. (2-tailed)	,456
Exact Sig. [2*(1-tailed Sig.)]	,700 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 5 & 7 (Mann witney)

	Uji in Vivo
Mann-Whitney U	3,000
Wilcoxon W	9,000
Z	-,696
Asymp. Sig. (2-tailed)	,487
Exact Sig. [2*(1-tailed Sig.)]	,700 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 5 & 8 (Mann witney)

	Uji in Vivo
Mann-Whitney U	3,000
Wilcoxon W	9,000
Z	-,696
Asymp. Sig. (2-tailed)	,487
Exact Sig. [2*(1-tailed Sig.)]	,700 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 5 & 9 (Mann witney)

	Uji in Vivo
Mann-Whitney U	2,500
Wilcoxon W	8,500
Z	-,913
Asymp. Sig. (2-tailed)	,361
Exact Sig. [2*(1-tailed Sig.)]	,400 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 6 & 7 (Mann witney)

	Uji in Vivo
Mann-Whitney U	2,500
Wilcoxon W	8,500
Z	-,913
Asymp. Sig. (2-tailed)	,361
Exact Sig. [2*(1-tailed Sig.)]	,400 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 6 & 8 (Mann witney)

	Uji in Vivo
Mann-Whitney U	2,000
Wilcoxon W	8,000
Z	-1,291
Asymp. Sig. (2-tailed)	,197
Exact Sig. [2*(1-tailed Sig.)]	,400 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 6 & 9 (Mann witney)

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,650
Asymp. Sig. (2-tailed)	,099
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 7 & 8 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	3,500
Wilcoxon W	9,500
Z	-,471
Asymp. Sig. (2-tailed)	,637
Exact Sig. [2*(1-tailed Sig.)]	,700 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 7 & 9 (Mann witney)

Test Statistics^a

	Uji in Vivo
Mann-Whitney U	1,000
Wilcoxon W	7,000
Z	-1,623
Asymp. Sig. (2-tailed)	,105
Exact Sig. [2*(1-tailed Sig.)]	,200 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Formula 8 & 9 (Mann witney)


Test Statistics^a

	Uji in Vivo
Mann-Whitney U	,000
Wilcoxon W	6,000
Z	-2,023
Asymp. Sig. (2-tailed)	,043
Exact Sig. [2*(1-tailed Sig.)]	,100 ^b

a. Grouping Variable: Formula

b. Not corrected for ties.

Lampiran 9. Kode Etik Hewan


KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET DAN TEKNOLOGI
UNIVERSITAS HASANUDDIN FAKULTAS KEDOKTERAN
KOMITE ETIK PENELITIAN KESEHATAN
RSPN UNIVERSITAS HASANUDDIN
RSUP Dr. WAHIDIN SUDIROHUSODO MAKASSAR
 Sekretariat : Lantai 2 Gedung Laboratorium Terpadu
 JL.PERINTIS KEMERDEKAAN KAMPUS TAMALANREA KM.10 MAKASSAR 90245.
 Contact Person: dr. Agusallim Bukhari, M.Med,Ph.D.,SpGK TELP. 001241050050, 0411 5760103, Fax : 0411-581431



REKOMENDASI PERSETUJUAN ETIK

Nomor : 124/UN4.6.4.5.31/ PP36/2022

Tanggal: 16 Maret 2022

Dengan ini Menyatakan bahwa Protokol dan Dokumen yang Berhubungan Dengan Protokol berikut ini telah mendapatkan Persetujuan Etik :

No Protokol	UH22020072	No Sponsor Protokol	
Peneliti Utama	Rezky Mulyani	Sponsor	
Judul Peneliti	Uji Aktivitas Perlindungan Tabir Surya Terhadap Sediaan Krim M/A dari Senyawa Fukoidan dengan Variasi Konsentrasi Phytocream sebagai Emulgator pada Tikus (<i>Rattus Norvegicus</i>)		
No Versi Protokol	2	Tanggal Versi	11 Maret 2022
No Versi PSP		Tanggal Versi	
Tempat Penelitian	Fakultas Farmasi Universitas Hasanuddin Makassar		
Jenis Review	<input type="checkbox"/> Exempted <input checked="" type="checkbox"/> Expedited <input type="checkbox"/> Fullboard Tanggal	Masa Berlaku 16 Maret 2022 sampai 16 Maret 2023	Frekuensi review lanjutan
Ketua KEPK FKUH RSUH dan RSWS	Nama Prof.Dr.dr. Suryani As'ad, M.Sc.,Sp.GK (K)	Tanda tangan	
Sekretaris KEPK FKUH RSUH dan RSWS	Nama dr. Agusallim Bukhari, M.Med.,Ph.D.,Sp.GK (K)	Tanda tangan	

Kewajiban Peneliti Utama:

- Menyerahkan Amandemen Protokol untuk persetujuan sebelum di implementasikan
- Menyerahkan Laporan SAE ke Komisi Etik dalam 24 Jam dan dilengkapi dalam 7 hari dan Laporan SUSAR dalam 72 Jam setelah Peneliti Utama menerima laporan
- Menyerahkan Laporan Kemajuan (progress report) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah
- Menyerahkan laporan akhir setelah Penelitian berakhir
- Melaporkan penyimpangan dari prokol yang disetujui (protocol deviation / violation)
- Mematuhi semua peraturan yang ditentukan