

LAMPIRAN

Lampiran 1. Rekapitulasi Data Hasil penelitian

Kelompok	Jumlah Eritrosit (juta/uL)									
	Pre					Post				
	1	2	3	4	5	1	2	3	4	5
Kontrol Hiperlipidemia	8,25	8,09	8,11	7,82	7,59	6,12	8,92	8,29	7,9	8,27
Kontrol Simvastatin	6,65	5,81	6,82	7,35	7,67	7,36	7,57	7,21	7,63	8,00
Dosis 1	6,47	6,41	6,44	5,6	6,89	7,73	7,55	7,56	6,22	8,07
Dosis 2	7,56	5,57	6,48	7,47	6,86	8,09	6,8	7,4	7,59	7,62
Dosis 3	7,22	7,57	7,02	7,41	7,89	7,36	7,86	8,43	7,94	9,26

Nilai normal : 5,67 – 9,2 juta sel/mm³

Kelompok	Kadar Hemoglobin (g/dL)									
	Pre					Post				
	1	2	3	4	5	1	2	3	4	5
Kontrol Hiperlipidemia	16,6	14,8	16,1	15,3	15,5	11,3	17,8	15,8	15,9	15,3
Kontrol Simvastatin	12,6	11,9	13,6	14,6	14,4	14,0	15,6	14,7	14,9	15,9
Dosis 1	14,5	15,4	14,4	14,1	14,7	14,9	15,7	14,5	13,2	15,2
Dosis 2	14,6	10,9	12,8	14,5	14,9	15,6	13,8	14,9	14,7	15,4
Dosis 3	13,9	15,3	15,8	15,0	16,9	14,6	16,1	17,4	16,2	18,2

Nilai normal : 11,1 – 18 mg/dl

Kelompok	Kadar Hematokrit (%)									
	Pre					Post				
	1	2	3	4	5	1	2	3	4	5
Kontrol Hiperlipidemia	42,5	37,3	41,8	38,1	40	39,7	46,6	40	40,4	38,8
Kontrol Simvastatin	31,5	29,8	34,6	38,5	39	35,7	38,7	36,7	39,3	41,2
Dosis 1	36,8	39,4	37,6	36,9	37,6	39,3	41,5	37,8	34,5	39,3
Dosis 2	38,6	36,7	36,8	37,2	38	41,8	35,6	38,3	38,5	39,4
Dosis 3	36,7	39,3	40,2	38,8	39,7	40,9	41,4	45,7	41,5	43

Nilai normal : 37,2 – 50,6%

Hasil pemeriksaan kolesterol

Kelompok	Kadar Kolesterol (mg/dl)					
	1	2	3	4	5	6
Negatif	232	245	251	238	257	243
Positif	241	259	247	234	253	246
Dosis 1	255	243	236	258	249	252
Dosis 2	246	239	252	231	256	244
dosis 3	250	244	237	254	242	248

Lampiran 5. Perhitungan

a. Jumlah sampel setiap kelompok

Untuk jumlah sampel yang dibutuhkan dalam setiap kelompok dihitung menggunakan rumus Federer, yaitu

$$(n-1)(t-1) \geq 15$$

$$(n-1)(5-1) \geq 15$$

$$(n-1)(4) \geq 15$$

$$4n - 4 \geq 15$$

$$4n \geq 15 + 4$$

$$n \geq 19/4$$

$$n \geq 5 \text{ (masing-masing kelompok memerlukan 5 tikus)}$$

b. Pembuatan Na-CMC 0,5%

Terdapat 4 kelompok yang membutuhkan Na-CMC

$$6 \times 4 = 24 \text{ ekor}$$

Untuk 16 hari perlakuan

$$24 \times 16 = 384 \text{ ml}$$

Apabila membuat Na-CMC 0,5% sebanyak 400 ml, maka berat Na-CMC yang dibutuhkan adalah:

$$\begin{aligned} \text{Berat Na CMC} &= \frac{0,5 \times 400}{100} \\ &= 2 \text{ gram} \end{aligned}$$

c. Perhitungan Simvastatin

	<i>Mencit 20g</i>	<i>Tikus 200g</i>	<i>Kelinci 1,5 kg</i>	<i>Manusia 70 kg</i>
<i>Mencit 20g</i>	1,0	7,0	27,80	387,9
<i>Tikus 200g</i>	0,14	1	3,9	56,0
<i>Kelinci 1,5 kg</i>	0,04	0,25	1,0	14,2
<i>Manusia 70 kg</i>	0,0026	0,018	0,07	1,0

- Dosis manusia untuk per kg berat badan

$$= 10 \text{ mg}/70 \text{ kg}$$

$$= 0,143 \text{ mg/kg BB}$$

- Dosis tikus

$$= 0,143 \text{ mg/kg} \times 70 \times 0,018$$

$$= 0,18 \text{ mg}$$

d. Perhitungan rendemen ekstrak

$$\% \text{Rendemen} = \frac{\text{berat awal}}{\text{berat akhir}}$$

$$\text{Rendemen} = \frac{14,984}{600} \times 100 = 2,497\%$$

e. Perhitungan ekstrak

- Dosis 25 mg/200 gBB

untuk 6 ekor tikus: $6 \times 25 \text{ mg} = 150 \text{ mg/hari}$

untuk perlakuan 16 hari: $150 \times 16 = 2.400 \text{ mg}$ atau 2,4 gram

dilarutkan dengan Na-CMC 0,5% sebanyak 96 ml

- Dosis 35 mg/200 gBB

untuk 6 ekor tikus: $6 \times 35 \text{ mg} = 210 \text{ mg/hari}$

untuk perlakuan 16 hari: $210 \times 16 = 3.360 \text{ mg}$ atau 3,36 gram

dilarutkan dengan Na-CMC 0,5% sebanyak 96 ml

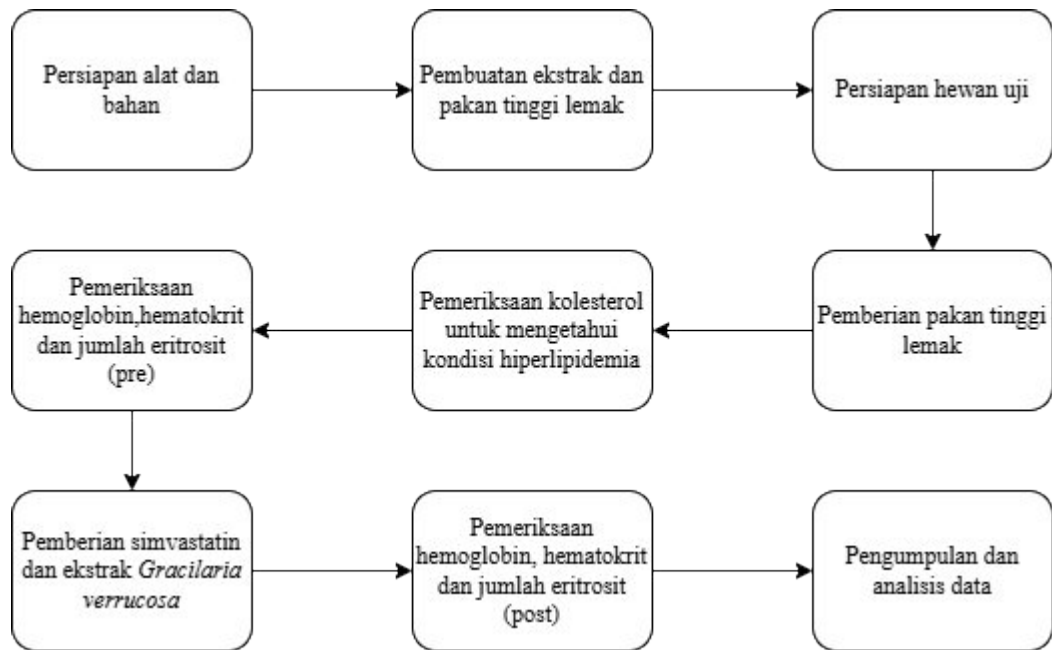
- Dosis 45 mg/200 gBB

untuk 6 ekor tikus: $6 \times 45 \text{ mg} = 270 \text{ mg/hari}$

untuk perlakuan 16 hari: $270 \times 16 = 4.320 \text{ mg}$ atau 4,32 gram

dilarutkan dengan Na-CMC 0,5% sebanyak 96 ml

Lampiran 6. Alur Penelitian



Lampiran 2. Hasil uji statistika

1. Hasil uji kadar hemoglobin

- Uji normalitas

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual for hemoglobin	,133	50	,026	,959	50	,077

a. Lilliefors Significance Correction

- Uji homogenitas

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
hemoglobin	Based on Mean	,561	4	45	,692
	Based on Median	,405	4	45	,804
	Based on Median and with adjusted df	,405	4	32,781	,804
	Based on trimmed mean	,502	4	45	,734

- Uji *Two-way* ANOVA

Tests of Between-Subjects Effects

Dependent Variable: hemoglobin

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	38,371 ^a	9	4,263	2,710	,014
Intercept	11083,818	1	11083,818	7046,239	,000
variasi	23,818	4	5,955	3,785	,011
prepost	7,039	1	7,039	4,475	,041
variasi * prepost	7,514	4	1,878	1,194	,328
Error	62,920	40	1,573		
Total	11185,110	50			
Corrected Total	101,291	49			

a. R Squared = ,379 (Adjusted R Squared = ,239)

- Uji *post hoc*

Multiple Comparisons

Dependent Variable: hemoglobin

Tukey HSD

(I) kelompok perlakuan	(J) kelompok perlakuan	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
negatif	positif	1,220	,5609	,210	-,382	2,822
	dosis 1	,806	,5609	,608	-,796	2,408
	dosis 2	1,230	,5609	,203	-,372	2,832
	dosis 3	-,500	,5609	,898	-2,102	1,102
positif	negatif	-1,220	,5609	,210	-2,822	,382
	dosis 1	-,414	,5609	,946	-2,016	1,188
	dosis 2	,010	,5609	1,000	-1,592	1,612
	dosis 3	-1,720*	,5609	,030	-3,322	-,118
dosis 1	negatif	-,806	,5609	,608	-2,408	,796
	positif	,414	,5609	,946	-1,188	2,016
	dosis 2	,424	,5609	,942	-1,178	2,026
	dosis 3	-1,306	,5609	,157	-2,908	,296
dosis 2	negatif	-1,230	,5609	,203	-2,832	,372
	positif	-,010	,5609	1,000	-1,612	1,592
	dosis 1	-,424	,5609	,942	-2,026	1,178
	dosis 3	-1,730*	,5609	,029	-3,332	-,128
dosis 3	negatif	,500	,5609	,898	-1,102	2,102
	positif	1,720*	,5609	,030	,118	3,322
	dosis 1	1,306	,5609	,157	-,296	2,908
	dosis 2	1,730*	,5609	,029	,128	3,332

Based on observed means.

The error term is Mean Square(Error) = 1,573.

*. The mean difference is significant at the 0,05 level.

2. Hasil uji kadar hematokrit

- Uji normalitas

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
hematokrit	,120	50	,070	,958	50	,072

a. Lilliefors Significance Correction

- Uji homogenitas

Test of Homogeneity of Variance

		Levene			
		Statistic	df1	df2	Sig.
hematokrit	Based on Mean	1,667	4	45	,174
t	Based on Median	1,335	4	45	,272
	Based on Median and with adjusted df	1,335	4	35,067	,277
	Based on trimmed mean	1,570	4	45	,199

- Uji *Two-way* ANOVA

Tests of Between-Subjects Effects

Dependent Variable: hematokrit

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	174,919 ^a	9	19,435	2,378	,029
Intercept	74405,389	1	74405,389	9102,356	,000
variasi	102,525	4	25,631	3,136	,025
prepost	35,280	1	35,280	4,316	,044
variasi * prepost	37,114	4	9,279	1,135	,354
Error	326,972	40	8,174		
Total	74907,280	50			
Corrected Total	501,891	49			

a. R Squared = ,349 (Adjusted R Squared = ,202)

- Uji *post hoc*

Multiple Comparisons

Dependent Variable: hematokrit

Tukey HSD

(I) kelompok perlakuan	(J) kelompok perlakuan	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
negatif	positif	3,000	1,2786	,152	-,652	6,652
	dosis 1	1,430	1,2786	,796	-2,222	5,082
	dosis 2	1,410	1,2786	,804	-2,242	5,062
	dosis 3	-1,220	1,2786	,874	-4,872	2,432
positif	negatif	-3,000	1,2786	,152	-6,652	,652
	dosis 1	-1,570	1,2786	,735	-5,222	2,082
	dosis 2	-1,590	1,2786	,726	-5,242	2,062
	dosis 3	-4,220*	1,2786	,016	-7,872	-,568
dosis 1	negatif	-1,430	1,2786	,796	-5,082	2,222
	positif	1,570	1,2786	,735	-2,082	5,222
	dosis 2	-,020	1,2786	1,000	-3,672	3,632
	dosis 3	-2,650	1,2786	,252	-6,302	1,002
dosis 2	negatif	-1,410	1,2786	,804	-5,062	2,242
	positif	1,590	1,2786	,726	-2,062	5,242
	dosis 1	,020	1,2786	1,000	-3,632	3,672
	dosis 3	-2,630	1,2786	,259	-6,282	1,022
dosis 3	negatif	1,220	1,2786	,874	-2,432	4,872
	positif	4,220*	1,2786	,016	,568	7,872
	dosis 1	2,650	1,2786	,252	-1,002	6,302
	dosis 2	2,630	1,2786	,259	-1,022	6,282

Based on observed means.

The error term is Mean Square(Error) = 8,174.

*. The mean difference is significant at the 0,05 level.

3. Hasil uji jumlah eritrosit

- Uji normalitas

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
eritrosit	,137	50	,019	,969	50	,216

a. Lilliefors Significance Correction

- Uji Homogenitas

Test of Homogeneity of Variance

		Levene			Sig.
		Statistic	df1	df2	
eritrosit	Based on Mean	,419	4	45	,794
	Based on Median	,360	4	45	,836
	Based on Median and with adjusted df	,360	4	41,694	,836
	Based on trimmed mean	,432	4	45	,785

- Uji *Two-way* ANOVA

Tests of Between-Subjects Effects

Dependent Variable: eritrosit

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	14,740 ^a	9	1,638	4,075	,001
Intercept	2734,449	1	2734,449	6804,634	,000
variasi	8,033	4	2,008	4,998	,002
prepost	4,942	1	4,942	12,299	,001
variasi * prepost	1,764	4	,441	1,097	,371
Error	16,074	40	,402		
Total	2765,263	50			
Corrected Total	30,814	49			

a. R Squared = ,478 (Adjusted R Squared = ,361)

- Uji *post hoc*

Multiple Comparisons

Dependent Variable: eritrosit

Tukey HSD

(I) kelompok perlakuan	(J) kelompok perlakuan	Mean Difference (I- J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
negatif	positif	,7290	,28350	,095	-,0807	1,5387
	dosis 1	1,0420*	,28350	,006	,2323	1,8517
	dosis 2	,7930	,28350	,057	-,0167	1,6027
	dosis 3	,1400	,28350	,987	-,6697	,9497
positif	negatif	-,7290	,28350	,095	-1,5387	,0807
	dosis 1	,3130	,28350	,803	-,4967	1,1227
	dosis 2	,0640	,28350	,999	-,7457	,8737
	dosis 3	-,5890	,28350	,250	-1,3987	,2207
dosis 1	negatif	-1,0420*	,28350	,006	-1,8517	-,2323
	positif	-,3130	,28350	,803	-1,1227	,4967
	dosis 2	-,2490	,28350	,903	-1,0587	,5607
	dosis 3	-,9020*	,28350	,022	-1,7117	-,0923
dosis 2	negatif	-,7930	,28350	,057	-1,6027	,0167
	positif	-,0640	,28350	,999	-,8737	,7457
	dosis 1	,2490	,28350	,903	-,5607	1,0587
	dosis 3	-,6530	,28350	,165	-1,4627	,1567
dosis 3	negatif	-,1400	,28350	,987	-,9497	,6697
	positif	,5890	,28350	,250	-,2207	1,3987
	dosis 1	,9020*	,28350	,022	,0923	1,7117
	dosis 2	,6530	,28350	,165	-,1567	1,4627

Based on observed means.

The error term is Mean Square(Error) = ,402.

*. The mean difference is significant at the 0,05 level.

Lampiran 3. Sertifikat *Ethical Clearance*



**UNIVERSITAS AIRLANGGA FACULTY OF DENTAL MEDICINE
HEALTH RESEARCH ETHICAL CLEARANCE COMMISSION**

ETHICAL CLEARANCE CERTIFICATE
Number: 0405/HRECC.FODM/IV/2026

Universitas Airlangga Faculty of Dental Medicine Health Research Ethical Clearance Commission has studied the proposed research design carefully, Declared to be ethically appropriate in accordance to 7 (seven) WHO 2011, and therefore, shall herewith certify that the research entitled:

“Effectiveness of Gracilaria verrucosa Seaweed Extract on Hemoglobin Levels, Hematocrit, and Erythrocyte Count in White Rats with Hyperlipidemia”

Principal Researcher : **FITRIA NUR FADILAH**

Unit/Institution/Place of Research : - Universitas Muhammadiyah Sidoarjo

CERTIFIED TO BE ETHICALLY CLEARED

Surabaya, April 10, 2026
Chairman,



Prof. Dr. ERNIE MADURATNA S., drg., M.Kes., Sp.Perio(K)
Official No. 196602121992032001

Lampiran 4. Dokumentasi penelitian



Pencucian rumput laut



Pengeringan rumput laut



Pengeringan dengan oven



Menghaluskan rumput laut



Maserasi



Penyaringan



Hasil penyaringan



Hasil ekstrak kental



Aklimatisasi tikus



Berat badan tikus awal



Pembuatan pakan tinggi lemak



Pakan tinggi lemak



Cek kolesterol setelah diet tinggi lemak



Berat badan tikus setelah diet tinggi lemak



Pengambilan darah sebelum perlakuan



Pemeriksaan darah sebelum perlakuan



Pembuatan Na-CMC



Pemberian obat dan ekstrak melalui sonde



Pemeriksaan kolesterol setelah perlakuan



Pengambilan darah setelah perlakuan



Pemeriksaan darah setelah perlakuan



Euthanasia