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LAMPIRAN

Lampiran 1. Data, Perhitungan dan Hasil Uji Statistik ANOVA serta Uji Lanjut Duncan pada Parameter Pengujian Hasil enkapsulasi Ekstrak Rebung dan Daun Balakacida

1. Uji Viskositas

- Data Hasil

Perlakuan		Viskositas	Rata-rata
A1	U1	6.10%	6.03%
	U2	6.10%	
	U3	5.90%	
A2	U1	6.90%	7.00%
	U2	6.40%	
	U3	7.70%	
A3	U1	16.00%	14.63%
	U2	13.10%	
	U3	14.80%	

- Uji statistik ANOVA dan uji lanjut *Duncan*

ANOVA

Viskositas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	133.162	2	66.581	77.822	.000
Within Groups	5.133	6	.856		
Total	138.296	8			

Post Hoc

Homogeneous

Viskositas

Duncan

Perlakuan	N	Subset for alpha = 0.05	
		1	2
A1	3	6.0333	
A2	3	7.0000	
A3	3		14.6333
Sig.		.248	1.000

Means for groups in homogeneous subsets are displayed.

2. Rendemen Enkapsulasi

- Data Hasil

Perlakuan	Massa awal (g)	massa akhir (g)	EE%
A1	240	122.82	51.18
A2	240	122	50.83
A3	240	58.16	24.23

- Perhitungan

A1

$$\%RE = \frac{massa\ enkapsulan}{massa\ awal} \times 100\%$$

$$\%RE = \frac{122{,}82}{240} \times 100\%$$

$$\%RE = 0{,}5118 \times 100\%$$

$$\%RE = 51{,}18\%$$

A2

$$\%RE = \frac{massa\ enkapsulan}{massa\ awal} \times 100\%$$

$$\%RE = \frac{122}{240} \times 100\%$$

$$\%RE = 0{,}508 \times 100\%$$

$$\%RE = 50{,}83\%$$

A3

$$\%RE = \frac{massa\ enkapsulan}{massa\ awal} \times 100\%$$

$$\%RE = \frac{58{,}16}{240} \times 100\%$$

$$\%RE = 0{,}242 \times 100\%$$

$$\%RE = 24{,}23\%$$

- Uji statistik ANOVA dan uji lanjut *Duncan*

ANOVA

Efisiensi Enkapsulsi

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	955.997	2	477.999	5.736E6	.000
Within Groups	.000	3	.000		
Total	955.997	5			

Post Hoc

Homogeneous

Efisiensi Enkapsulsi

Duncan

Perlakuan efi...	N	Subset for alpha = 0.05		
		1	2	3
A3	2	24.2350		
A2	2		50.8300	
A1	2			51.1900
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

3. Kadar Air

- Data Hasil

Perlakuan		kadar air	Rata-rata
A1	U1	6.21%	6.28%
	U2	6.33%	
	U3	6.30%	
A2	U1	6.40%	6.44%
	U2	6.52%	
	U3	6.41%	
A3	U1	9.00%	8.82%
	U2	8.75%	
	U3	8.60%	

- Uji statistik ANOVA dan uji lanjut *Duncan*

ANOVA

Kadar Air

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11.769	2	5.884	359.053	.000
Within Groups	.098	6	.016		
Total	11.867	8			

Post Hoc

Homogeneous

Kadar Air

Duncan

Perlakuan	N	Subset for alpha = 0.05	
		1	2
A1	3	6.2800	
A2	3	6.4433	
A3	3		8.7833
Sig.		.169	1.000

Means for groups in homogeneous subsets are displayed.

4. Peningkatan Kadar Air

- Data Hasil

Perlakuan		kadar air Minggu Ke-0	Rata-rata	Kadar air Minggu Ke-4	Rata-Rata	Peningkatan
A1	U1	6.21%	6.28%	8.59%	8.90%	2.62%
	U2	6.33%		9.10%		
	U3	6.30%		9.00%		
A2	U1	6.40%	6.44%	8.20%	8.12%	1.68%
	U2	6.52%		8.21%		
	U3	6.41%		7.95%		
A3	U1	9.00%	8.82%	14.00%	14.07%	5.25%
	U2	8.75%		14.40%		
	U3	8.60%		13.79%		

- Perhitungan

A1

$$Peningkatan\ kadar\ air = \mathrm{X_{akhir}} - \mathrm{X_{awal}}$$

$$Peningkatan\ kadar\ air = 8{,}90\% - 6{,}28\%$$

$$Peningkatan\ kadar\ air = 2{,}62\%$$

A2

$$Peningkatan\ kadar\ air = \mathrm{X_{akhir}} - \mathrm{X_{awal}}$$

$$Peningkatan\ kadar\ air = 8{,}12\% - 6{,}44\%$$

$$Peningkatan\ kadar\ air = 1{,}68\%$$

A3

$$Peningkatan\ kadar\ air = \mathrm{X_{akhir}} - \mathrm{X_{awal}}$$

$$Peningkatan\ kadar\ air = 14{,}07\% - 8{,}82\%$$

$$Peningkatan\ kadar\ air = 5{,}25\%$$

- Uji statistik ANOVA dan uji lanjut *Duncan*

ANOVA

SKB

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	20.587	2	10.293	154.504	.000
Within Groups	.400	6	.067		
Total	20.986	8			

Post Hoc

Homogeneous

SKB

Duncan

Perlakuan	N	Subset for alpha = 0.05		
		1	2	3
A2	3	1.6767		
A1	3		2.6167	
A3	3			5.2500
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

5. Intensitas Warna

- Data Hasil

Perlakuan		Data Perlakuan				Rata-Rata			
		L	**a**	**b**	**^DE**	**L**	**a**	**b**	**^DE**
Standar		0.00	0.26	11.51	0.00	0.00	0.26	11.51	0.00
A1	U1	83.63	1.00	21.86	84.27	83.80	1.00	21.74	84.42
	U2	83.97	1.00	21.61	84.58				
A2	U1	80.3	0.64	24.67	81.37	80.09	0.65	24.95	81.21
	U2	79.87	0.65	25.22	81.04				
A3	U1	78.81	0.77	26.64	80.25	79.06	0.73	26.52	80.47
	U2	79.31	0.68	26.39	80.69				

- Perhitungan

A1

$\Delta E = \sqrt{(L - L_S)^2 + (a - a_S)^2 + (b - b_S)^2}$

$\Delta E = \sqrt{(83{,}80 - 0{,}00)^2 + (1{,}00 - 0{,}26)^2 + (21{,}74 - 11{,}51)^2}$

$\Delta E = \sqrt{(83{,}80)^2 + (0{,}74)^2 + (11{,}51)^2}$

$\Delta E = \sqrt{7022{,}45 + 0{,}548 + 132{,}48}$

$\Delta E = \sqrt{7155{,}48}$

$\Delta E = 84{,}42$

A2

$\Delta E = \sqrt{(L - L_S)^2 + (a - a_S)^2 + (b - b_S)^2}$

$\Delta E = \sqrt{(80{,}09 - 0{,}00)^2 + (0{,}65 - 0{,}26)^2 + (24{,}95 - 11{,}51)^2}$

$\Delta E = \sqrt{(80{,}09)^2 + (0{,}39)^2 + (13{,}44)^2}$

$\Delta E = \sqrt{6414{,}41 + 0{,}1521 + 180{,}633}$

$\Delta E = \sqrt{6595{,}19}$

$\Delta E = 81{,}21$

A3

$\Delta E = \sqrt{(L - L_S)^2 + (a - a_S)^2 + (b - b_S)^2}$

$\Delta E = \sqrt{(79{,}06 - 0{,}00)^2 + (0{,}73 - 0{,}26)^2 + (26{,}52 - 11{,}51)^2}$

$\Delta E = \sqrt{(79{,}06)^2 + (0{,}47)^2 + (15{,}01)^2}$

$\Delta E = \sqrt{6250{,}48 + 0{,}2209 + 225{,}30}$

$\Delta E = \sqrt{6476{,}00}$

$\Delta E = 80{,}47$

- Uji statistik ANOVA dan uji lanjut *Duncan*

1. Nilai DE

ANOVA

Warna

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17.653	2	8.826	127.856	.001
Within Groups	.207	3	.069		
Total	17.860	5			

Post Hoc

Homogeneous

Warna

Duncan

Perla kuan W...	N	Subset for alpha = 0.05	
		1	2
A3	2	80.4750	
A2	2	81.2100	
A1	2		84.4250
Sig.		.068	1.000

Means for groups in homogeneous subsets are displayed.

2. Nilai L*

ANOVA

Light

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	24.880	2	12.440	135.584	.001
Within Groups	.275	3	.092		
Total	25.155	5			

Post Hoc

Homogeneous

Light

Duncan

Perla kuan W...	N	Subset for alpha = 0.05		
		1	2	3
A3	2	79.0600		
A2	2		80.0850	
A1	2			83.8000
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

3. Nilai a*

ANOVA

amp

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.139	2	.069	50.744	.005
Within Groups	.004	3	.001		
Total	.143	5			

Post Hoc

Homogeneous

amp

Duncan

Perlakuan W...	N	Subset for alpha = 0.05	
		1	2
A2	2	.6450	
A3	2	.7250	
A1	2		1.0000
Sig.		.119	1.000

Means for groups in homogeneous subsets are displayed.

4. Nilai b*

ANOVA

bright

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	23.745	2	11.872	166.631	.001
Within Groups	.214	3	.071		
Total	23.959	5			

Post Hoc

Homogeneous

bright

Duncan

Perlakuan W...	N	Subset for alpha = 0.05		
		1	2	3
A1	2	21.7350		
A2	2		24.9450	
A3	2			26.5150
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

6. Kelarutan dalam Air

- Hasil Data

Perlakuan		Berat Awal (g)	Berat Akhir (g)	Rata-rata Berat Akhir (g)	Kelarutan	Rata-rata
A1	U1	0.17	0.1599	0,1611	94.06%	94.78%
	U2	0.17	0.1619		95.24%	
	U3	0.17	0.1616		95.06%	
A2	U1	0.17	0.1621	0,1624	95.35%	95.53%
	U2	0.17	0.1626		95.65%	
	U3	0.17	0.1625		95.59%	
A3	U1	0.17	0.1608	0,1618	94.59%	95.18%
	U2	0.17	0.1628		95.76%	
	U3	0.17	0.1618		95.18%	

- Perhitungan

A1

$$S\% = \frac{\text{berat supernatan kering (g)}}{\text{berat sampel awal (g)}} \times 100\%$$

$$S\% = \frac{0,1611}{0,17} \times 100\%$$

$$S\% = 94,78\%$$

A2

$$S\% = \frac{\text{berat supernatan kering (g)}}{\text{berat sampel awal (g)}} \times 100\%$$

$$S\% = \frac{0,1626}{0,17} \times 100\%$$

$$S\% = 95,53\%$$

A3

$$S\% = \frac{\text{berat supernatan kering (g)}}{\text{berat sampel awal (g)}} \times 100\%$$

$$S\% = \frac{0,1618}{0,17} \times 100\%$$

$$S\% = 95,18\%$$

- Uji statistik ANOVA dan uji lanjut *Duncan*

ANOVA

Kelarutan dalam Air

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.829	2	.415	1.613	.275
Within Groups	1.543	6	.257		
Total	2.373	8			

Post Hoc

Homogeneous

Kelarutan dalam Air

Duncan

Perlakuan	N	Subset for alpha = 0.05
		1
A1	3	94.7867
A3	3	95.1767
A2	3	95.5300
Sig.		.134

Means for groups in homogeneous subsets are displayed.

7. Penentuan Perlakuan Terbaik

- Data Hasil

Parameter	Urutan	Skor	Bobot Nilai
Stabilitas Kelembaban	1	6	0.20
Kelarutan	1	6	0.20
Kadar Air	2	5	0.17
Ukuran Partikel	3	4	0.13
Morfologi	4	3	0.10
Warna	4	3	0.10
Rendemen	5	2	0.07
Viskositas	6	1	0.03
Total		**30**	**1.00**

Parameter	Terbaik	Terburuk	A1		A2		A3	
			NE	NP	NE	NP	NE	NP
Peningkatan Kadar Air	1,68	5,25	0.74	0.15	1.00	0.20	0.00	0.00
Kelarutan	95.53	94.78	0.00	0.00	1.00	0.20	0.52	0.10
Kadar Air	6.28	8.78	1.00	0.17	0.94	0.16	0.00	0.00
Uk Partikel	3.55	4.08	1.00	0.13	0.30	0.04	0.00	0.00
Morfologi	3.00	1.00	0.00	0.00	0.50	0.05	1.00	0.10
Warna	83.39	86.58	0.00	0.00	0.85	0.08	1.00	0.10
Rendemen	51.18	24.23	1.00	0.07	0.99	0.07	0.00	0.00
Viskositas	6.03	14.63	1.00	0.03	0.89	0.03	0.00	0.00
			0.59	0.07	0.81	0.10	0.32	0.04

- Perhitungan

Peningkatan Kadar Air

- Bobot Nilai

$$\text{BN} = \frac{\text{Skor Perlakuan}}{\text{Total Skor perlakuan}}$$

$$\text{BN} = \frac{6}{30}$$

$$\text{BN} = 0{,}20$$

- Nilai Efektifitas

$$\text{NE} = \frac{\text{Nilai perlakuan} - \text{Nilai terburuk}}{\text{Nilai terbaik} - \text{Nilai terburuk}}$$

A1

$$\text{NE} = \frac{2{,}62 - 5{,}25}{1{,}68 - 5{,}25}$$

$$\text{NE} = 0{,}74$$

A2

$$\text{NE} = \frac{1{,}68 - 5{,}25}{1{,}68 - 5{,}25}$$

$$\text{NE} = 1{,}00$$

A3

$$\text{NE} = \frac{5{,}25 - 5{,}25}{1{,}68 - 5{,}25}$$

$$\text{NE} = 0{,}00$$

- Nilai Produk

$$\text{NP} = \text{BN} \times \text{NE}$$

A1

$$\text{NP} = 0{,}20 \times 0{,}74$$

$$\text{NP} = 0{,}15$$

A2

$$\mathrm{NP} = 0{,}20 \times 1{,}00$$
$$\mathrm{NP} = 0{,}20$$

A3

$$\mathrm{NP} = 0{,}20 \times 0{,}00$$
$$\mathrm{NP} = 0{,}00$$

Kelarutan dalam Air

- Bobot Nilai

$$\mathrm{BN} = \frac{\text{Skor Perlakuan}}{\text{Total Skor perlakuan}}$$
$$\mathrm{BN} = \frac{6}{30}$$
$$\mathrm{BN} = 0{,}20$$

- Nilai Efektifitas

$$\mathrm{NE} = \frac{\text{Nilai perlakuan} - \text{Nilai terburuk}}{\text{Nilai terbaik} - \text{Nilai terburuk}}$$

A1

$$\mathrm{NE} = \frac{94{,}78 - 94{,}78}{95{,}53 - 94{,}78}$$
$$\mathrm{NE} = 0{,}00$$

A2

$$\mathrm{NE} = \frac{95{,}53 - 94{,}78}{95{,}53 - 94{,}78}$$
$$\mathrm{NE} = 1{,}00$$

A3

$$\mathrm{NE} = \frac{95{,}17 - 94{,}78}{95{,}53 - 94{,}78}$$
$$\mathrm{NE} = 0{,}52$$

- Nilai Produk

$$\mathrm{NP} = \mathrm{BN} \times \mathrm{NE}$$

A1

$$\mathrm{NP} = 0{,}20 \times 0{,}00$$
$$\mathrm{NP} = 0{,}00$$

A2

$$\mathrm{NP} = 0{,}20 \times 1{,}00$$
$$\mathrm{NP} = 0{,}20$$

A3

$$\mathrm{NP} = 0{,}20 \times 0{,}52$$
$$\mathrm{NP} = 0{,}10$$

Viskositas

- Bobot Nilai

$$\mathrm{BN} = \frac{\text{Skor Perlakuan}}{\text{Total Skor perlakuan}}$$

$$\mathrm{BN} = \frac{1}{30}$$
$$\mathrm{BN} = 0{,}03$$

- Nilai Efektifitas

$$\mathrm{NE} = \frac{\text{Nilai perlakuan} - \text{Nilai terburuk}}{\text{Nilai terbaik} - \text{Nilai terburuk}}$$

A1

$$\mathrm{NE} = \frac{6{,}03 - 14{,}63}{6{,}03 - 14{,}63}$$
$$\mathrm{NE} = 1{,}00$$

A2

$$\mathrm{NE} = \frac{7{,}00 - 14{,}63}{6{,}03 - 14{,}63}$$
$$\mathrm{NE} = 0{,}89$$

A3

$$\mathrm{NE} = \frac{14{,}63 - 14{,}63}{6{,}03 - 14{,}63}$$
$$\mathrm{NE} = 0{,}00$$

- Nilai Produk

$$\mathrm{NP} = \mathrm{BN} \times \mathrm{NE}$$

A1

$$\mathrm{NP} = 0{,}03 \times 1{,}00$$
$$\mathrm{NP} = 0{,}03$$

A2

$$\mathrm{NP} = 0{,}03 \times 0{,}89$$
$$\mathrm{NP} = 0{,}03$$

A3

$$\mathrm{NP} = 0{,}03 \times 0{,}00$$
$$\mathrm{NP} = 0{,}00$$

Lampiran 2. Data, Perhitungan dan Hasil Uji Statistik Independent T-test pada Parameter Pengujian in vivo Ekstrak Rebung dan Daun Balakacida Sebelum dan Setelah Enkapsulasi

- Data Hasil

Perlakuan		Chole awal (mg/dL)	Rata^2	Chole akhir (mg/dL)	Rata^2	Penurunan Chole (mg/dL)	% penurunan
A0	U1	134	130	115	108,66	19	14.18
	U2	125		107		18	14.40
	U3	131		104		27	20.61
A2	U1	139	135,33	117	112	22	15.83
	U2	135		109		26	19.26
	U3	132		110		22	16.67

- Perhitungan

Penurunan Kolesterol = Kolesterol awal-kolesterol akhir

$$\% \text{ Penurunan Kolesterol} = \frac{C_{awal} - C_{akhir}}{C_{awal}} \times 100\%$$

A0

Penurunan Kolesterol = 130-108,66

Penurunan Kolesterol = 21,34

$$\% \text{ Penurunan Kolesterol} = \frac{130\text{-}108,66}{130} \times 100\%$$

$$\% \text{ Penurunan Kolesterol} = \frac{21,34}{130} \times 100\%$$

$$\% \text{ Penurunan Kolesterol} = 0,1641 \times 100\%$$

$$\% \text{ Penurunan Kolesterol} = 16,41\%$$

A2

Penurunan Kolesterol = 135,33-112

Penurunan Kolesterol = 23,33

$$\% \text{ Penurunan Kolesterol} = \frac{135,33\text{-}112}{135,33} \times 100\%$$

$$\% \text{ Penurunan Kolesterol} = \frac{23,33}{135,33} \times 100\%$$

$$\% \text{ Penurunan Kolesterol} = 0,1723 \times 100\%$$

$$\% \text{ Penurunan Kolesterol} = 17,23\%$$

- Uji statistik *Independen T-test*

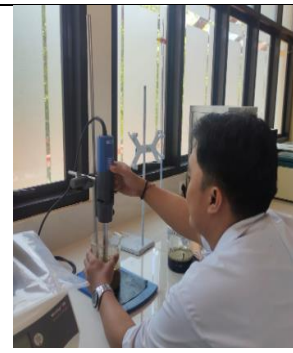
Group Statistics

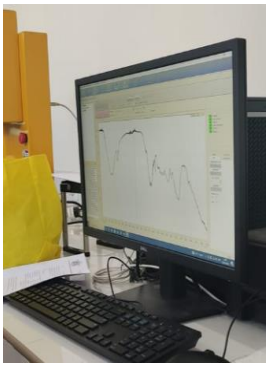
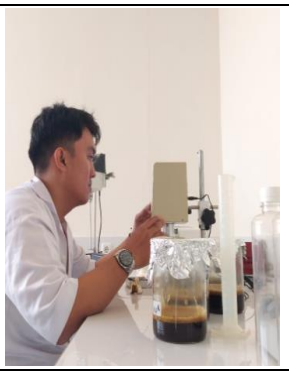
	perlakuan	N	Mean	Std. Deviation	Std. Error Mean
penurunan_kolesterol	A0	3	21.3333	4.93288	2.84800
	A2	3	23.3333	2.30940	1.33333

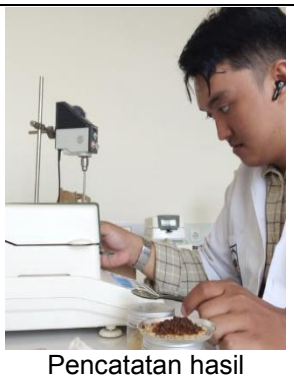
Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
penurunan_kolesterol	Equal variances assumed	3.411	.139	-.636	4	.559	-2.00000	3.14466	-10.73098	6.73098
	Equal variances not assumed			-.636	2.837	.572	-2.00000	3.14466	-12.34204	8.34204

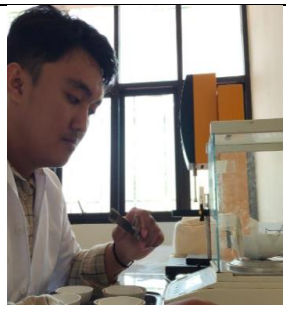
Lampiran 3. Dokumentasi Penelitian Enkapsulasi Ekstrak Rebung dan Daun Balakacida dengan *Spray Drying*

<table>
<tr><th colspan="3">Pembuatan Ekstrak dan Enkapsulasi</th></tr>
<tr>
<td> 
Pengeringan Daun Balakacida</td>
<td> 
Proses Ekstraksi dengan Pelarut Etanol</td>
<td> 
Pengeringan Rebung menggunakan Oven</td>
</tr>
<tr>
<td> 
Proses Evaporasi Ekstrak Rebung</td>
<td> 
Penyaringan hasil Ekstraksi</td>
<td> 
Proses Evaporasi Ekstrak Daun Balakacida</td>
</tr>
<tr>
<td> 
Penentuan Formulasi Enkapsulat</td>
<td> 
Pencampuran tiap Bahan</td>
<td> 
Proses Homogenisasi Enkapsulat</td>
</tr>
</table>

 Pengeringan dengan Spray Dryer	 Preparasi Hasil Enkapsulasi	 Pengambilan mikrokapsul pada Tabung
Uji FTIR		
 Pengujian Sampel dengan FTIR	 Pengamatan Spektrum FTIR	 Pengamatan Titik Serapan dan Puncak Gelombang
Uji Viskositas		
		

<table>
<tr><th colspan="3">Rendemen Enkapsulasi</th></tr>
<tr><td colspan="2"> 
Penimbangan Bahan Sebelum Enkapsulasi</td><td> 
Penimbangan Sampel Hasil Enkapsulasi</td></tr>
<tr><th colspan="3">Uji Kadar Air dan Kelembaban</th></tr>
<tr><td> 
Penimbangan Mikrokapsul</td><td> 
Penyesuaian Setting Moisture Analyzer</td><td> 
Pencatatan hasil Kadar Air</td></tr>
<tr><th colspan="3">Uji Morfologi dan Ukuran Partikel (Scanning Electron Microscope)</th></tr>
<tr><td> 
Proses Coating dan Pengujian SEM</td><td> 
Proses Capture dan Pengukuran Partikel</td><td> 
Proses Setting Pengujian SEM</td></tr>
</table>

Uji Kelarutan



Penimbangan Sampel dan Cawan Porselen

Pengeringan menggunakan oven

Penimbangan Sampel setelah Oven

Proses Pencampuran dengan Air

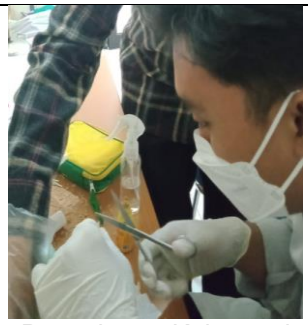
Proses Pemanasan pada *Hot Plate*

Proses Pemisahan dengan Sentrifugasi

Uji *In vivo*

Pengkondisian Tikus

Proses Induksi Kolesterol



Pengukuran Kolesterol Awal

Pengambilan darah pada ekor Tikus

Pengukuran Kolesterol Akhir

Lampiran 4. Riwayat Hidup Peneliti

CURRICULUM VITAE

A. Data Pribadi

1.	**Nama**	**: Dinal Try Dermawan**
2.	**Tempat, tgl. Lahir**	**: Takalar, 27 September 2001**
3.	**Alamat**	**: Jl. Sultan Hasanuddin No. 43, Kab. Takalar**
4.	**Kewarganegaraan**	**: Indonesia**

B. Riwayat Pendidikan

1. Tamat SD tahun 2013 di SD Negeri 4 Sompu
2. Tamat SMP tahun 2016 di SMP Negeri 2 Takalar
3. Tamat SMA tahun 2019 di SMA Negeri 1 Takalar

C. Pekerjaan dan Riwayat Pekerjaan

- Jenis Pekerjaan **: Mahasiswa**
- NIP atau Identitas Lain (NIK) **:** 7305072709010005
- Pangkat/Jabatan **: -**