

LAMPIRAN

Lampiran 1. Certificate Of Analysis Minyak Alpukat

CERTIFICATE OF ANALYSIS

Product Name : AVOCADO OIL
Botanical Name : Persea gratissima
Product Code : 180021
Batch No : 201811/177426
Appearance : Slight Viscous Clear Liquid
Colour : Light Yellow - Yellow
Odor : Neutral Odorless
Production Date : August 17, 2021
Shelf Life : 24 Months (unopened containers)
Quantity of Purchased : 1000 ml
Packaging : 1000 ml / 1000 g

ORION NATURE

Technical Analysis

Test Item	Specification	Result
Density (@20°C)	0.9007 - 0.9311	0.9195
Specific Gravity (@25°C)	0.9019 - 0.9324	0.9172
Refractive Index (@25°C)	1.4521 - 1.4827	1.4730
Solubility	Insoluble in Water	Conform

Storage Condition : Store unopened containers with temperature between 10°C to 25°C



Lampiran 2. Surat Izin Penelitian

SURAT IZIN PENELITIAN

Yang bertanda tangan di bawah ini Sekretaris Program Studi Farmasi menyatakan,

Nama : Nur Rahmadani Atsoran
NIM : 221520054

Dapat melaksanakan penelitian di Laboratorium *Teknik dan Kimia* Fakultas Farmasi Universitas Muhammadiyah Palopo.

Palopo, 18 Desember 2021


Apt. Andi Sry Handayani, S.Farm., M.Farm.
NUPTK-4049774675230303

Lampiran 3. Kode Etik

Lembaga Penelitian dan Pengabdian kepada Masyarakat
Universitas Muhammadiyah Palopo
Institution of Research and Community Services
Muhammadiyah University Palopo

KETERANGAN LAYAK PENELITIAN
ETHICAL APPROVAL LETTER
Nomor/Number: 207/KEP/III.3.AU/F/2026

Komisi Etik Penelitian Universitas Muhammadiyah Palopo, setelah mempelajari dan melakukan kajian etik secara seksama usulan rancangan penelitian, dengan ini menyatakan bahwa penelitian dengan:

The Research Ethics Commission of Muhammadiyah University Palopo, having thoroughly scutinized and completed ethical reviews on the research plan proposal, hereby certifies that:

Judul : Formulasi Serum Rambut Berbasis Minyak Alpukat (*Persea Americana*)
Evaluasi Stabilitas Fisik Dan Uji Aktivitas Antioksidan

Title : Avocado Oil-Based Hair Serum Formulation (*Persea Americana*) Physical
Stability Evaluation and Antioxidant Activity Test

Researcher : 1. Nur Rahmadani Atsman
2. Apt. Al Syahril Samsi, S.Farm., M.Si
3. Dr. Apt. Andi Nadhira, M.Mars., M. Kes

Dengan ini menyatakan bahwa protokol tersebut DITERIMA
Hereby declares that the protocol is APPROVED

Palopo, 06 Mei 2026
Ketua / Chairman

Junaidi, S.E., M.Ak., Ph.D.
NIDN.0910067705

Lampiran 4. Surat Keterangan Selesai Penelitian



PIMPINAN PUSAT MUHAMMADIYAH
MAJELIS PENDIDIKAN TINGGI, PENELITIAN, DAN PENGEMBANGAN
UNIVERSITAS MUHAMMADIYAH PALOPO
FAKULTAS ILMU KESEHATAN
PROGRAM STUDI FARMASI
LABORATORIUM FARMASI

Kampus: Jl. Jenderal Sudirman Km. 3 Binturu Kota Palopo
Telp/Fax. (0471) 327429 Email: institusi@umpalopo.ac.id
Website: <http://www.umpalopo.ac.id>

SURAT KETERANGAN
NOMOR: 023KET/III.3.AU/LAB-FARM/F/2026

Yang bertanda tangan dibawah ini :

Nama : apt. Waode Suiyarti., S.Si., M.Si

Jabatan : Ketua Program Studi Farmasi

Menerangkan dengan sesungguhnya bahwa :

Nama : Nur Rahmadani Atsman

Nim : 221320054

Judul : FORMULASI SERUM RAMBUT BERBASIS MINYAK
ALPUKAT (*Persea americana*): EVALUASI STABILITAS
FISIK DAN UJI AKTIVITAS ANTIOKSIDAN

Jurusan/Prodi : Farmasi (S1)

Perguruan Tinggi : Universitas Muhammadiyah Palopo

Telah menyelesaikan segala kewajiban terkait dengan peminjaman/penggunaan fasilitas Laboratorium selama yang bersangkutan melaksanakan kegiatan penelitian di lingkup laboratorium Farmasi Universitas Muhammadiyah Palopo, sehingga diberikan Surat Keterangan bebas Laboratorium ini.

Demikian Surat Keterangan ini diberikan untuk dipergunakan sebagaimana mestinya.

Palopo, 08 Juni 2026

Ketua Program Studi Farmasi



apt. Wackle Suiyarti., S.Si., M.Si
NIDN. 0904108703

Lampiran 5. Perhitungan Formulasi

1. Formula 1 (5%)

$$\begin{aligned}\text{Minyak Alpukat} &: \frac{5}{100} \times 50 = 2,5 \text{ ml} \\ \text{Tween 80} &: \frac{35}{100} \times 50 = 17,5 \text{ ml} \\ \text{Gliserin} &: \frac{25}{100} \times 50 = 12,5 \text{ ml} \\ \text{Metil Paraben} &: \frac{0,1}{100} \times 50 = 0,05 \text{ gr} \\ \text{Propil Paraben} &: \frac{0,1}{100} \times 50 = 0,05 \text{ gr} \\ \text{Lavender Essential Oil} &: \text{q.s} \\ \text{Aquadest} &: 50 - (2,5 + 17,5 + 12,5 + 0,05 + 0,05) = 50 - 32,6 \\ &= 17,4 \text{ ml}\end{aligned}$$

2. Formula 2 (10%)

$$\begin{aligned}\text{Minyak Alpukat} &: \frac{10}{100} \times 50 = 5 \text{ ml} \\ \text{Tween 80} &: \frac{35}{100} \times 50 = 17,5 \text{ ml} \\ \text{Gliserin} &: \frac{25}{100} \times 50 = 12,5 \text{ ml} \\ \text{Metil Paraben} &: \frac{0,1}{100} \times 50 = 0,05 \text{ gr} \\ \text{Propil Paraben} &: \frac{0,1}{100} \times 50 = 0,05 \text{ gr} \\ \text{Lavender Essential Oil} &: \text{q.s} \\ \text{Aquadest} &: 50 - (5 + 17,5 + 12,5 + 0,05 + 0,05) = 50 - 35,1 \\ &= 14,9 \text{ ml}\end{aligned}$$

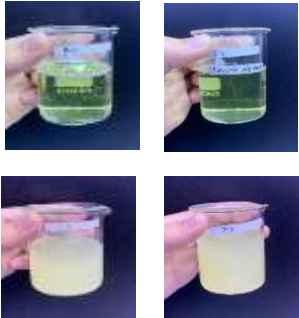
3. Formula 3 (15%)

$$\begin{aligned}\text{Minyak Alpukat} &: \frac{15}{100} \times 50 = 7,5 \text{ ml} \\ \text{Tween 80} &: \frac{35}{100} \times 50 = 17,5 \text{ ml} \\ \text{Gliserin} &: \frac{25}{100} \times 50 = 12,5 \text{ ml} \\ \text{Metil Paraben} &: \frac{0,1}{100} \times 50 = 0,05 \text{ gr} \\ \text{Propil Paraben} &: \frac{0,1}{100} \times 50 = 0,05 \text{ gr}\end{aligned}$$

Lavender Essential Oil : q.s

Aquadest : $50 - (7,5 + 17,5 + 12,5 + 0,05 + 0,05) = 50 - 37,6$
= 12,4 ml

Lampiran 6. Proses Pembuatan Sediaan

Gambar	Keterangan
	Penyiapan bahan pembuatan sediaan serum rambut
	Proses pemanasan aquadest dan tween 80
	Proses pencampuran zat aktif ke dalam sediaan sambil dipanaskan
	Tampak sediaan setelah dibuat

Lampiran 7. Uji Sifat Fisik Sediaan

Gambar	Keterangan
	Pengujian organoleptik sediaan
	Pengujian homogenitas sediaan
	Pengujian pH sediaan
	Pengujian daya sebar sediaan

	Pengujian viskositas sediaan
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Lampiran 8. Uji Iritasi dan Uji Hedonik

Gambar	Keterangan
	Tampak kulit sebelum uji iritasi
	Tampak kulit setelah uji iritasi
	Dokumentasi kuesioner penilaian uji iritasi



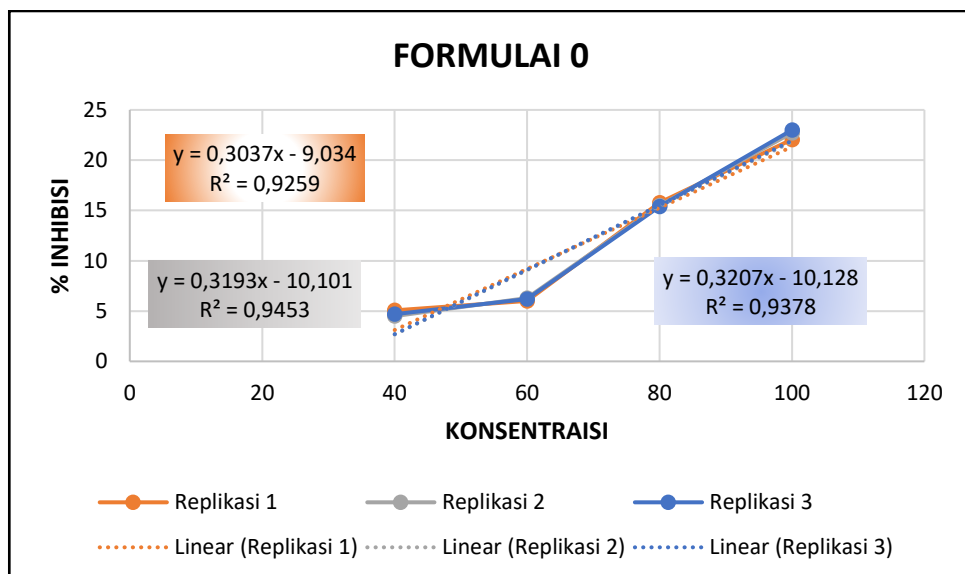
Dokumentasi kuesioner
penilaian uji hedonik

Lampiran 9. Uji Antioksidan

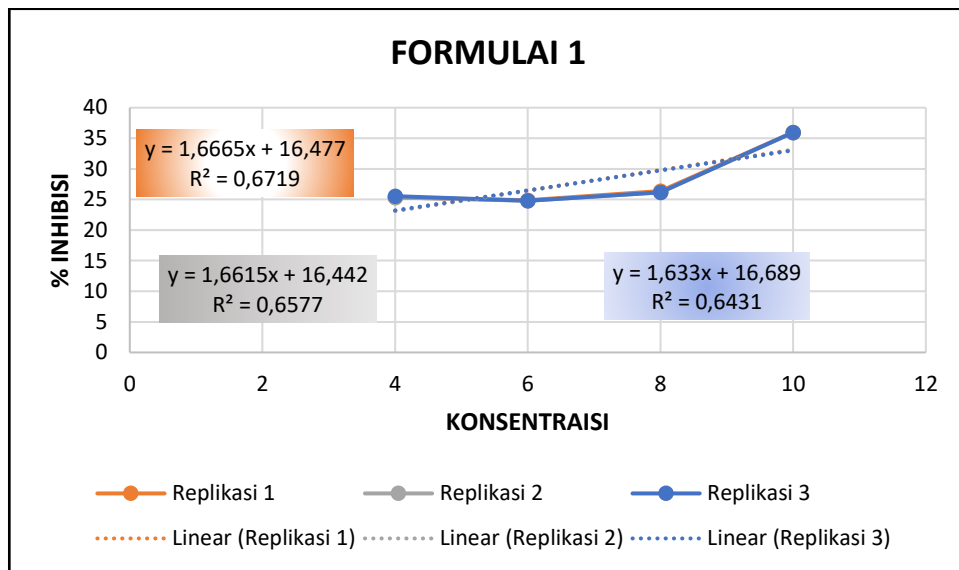
A. Pengukuran Absorbansi



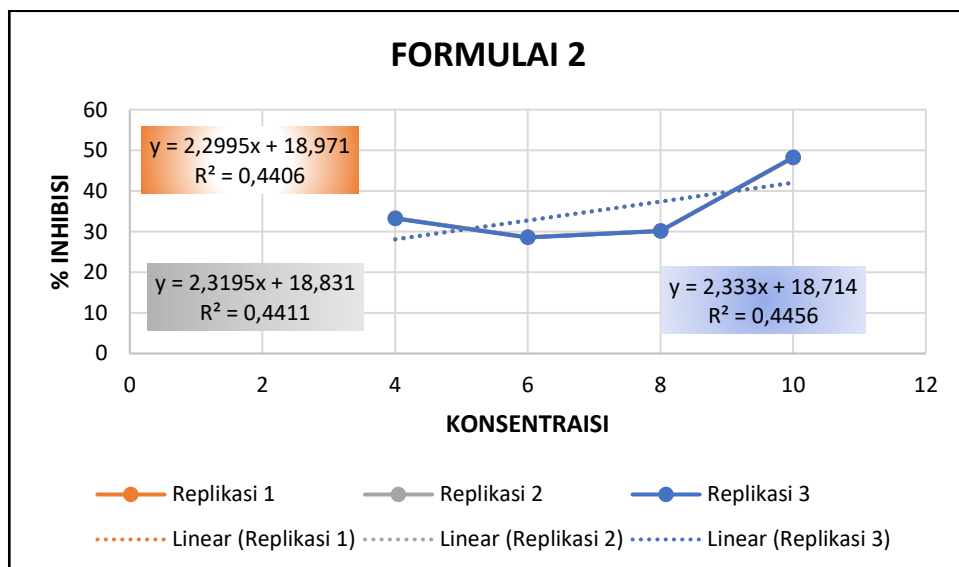
B. Kurva Antioksidan F0



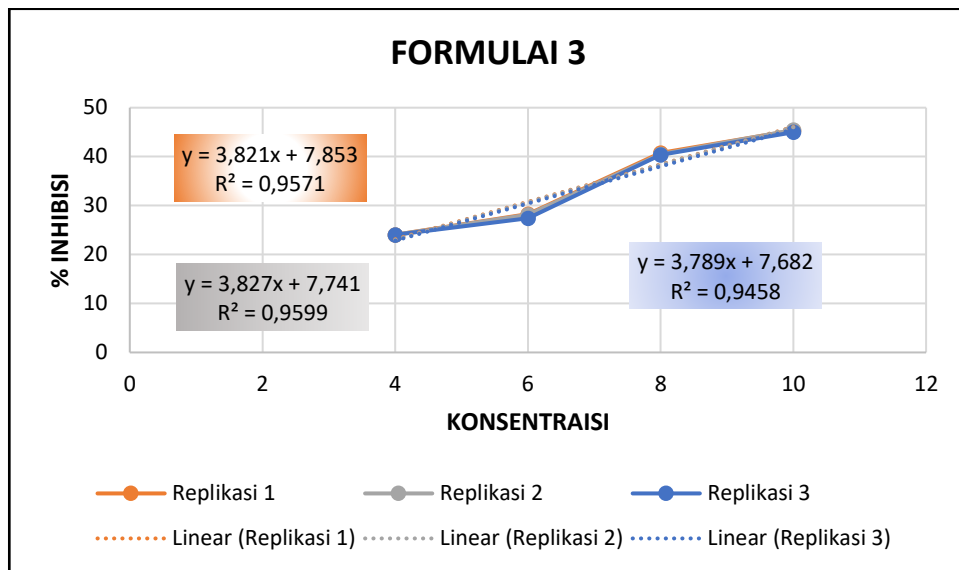
C. Kurva Antioksidan F1



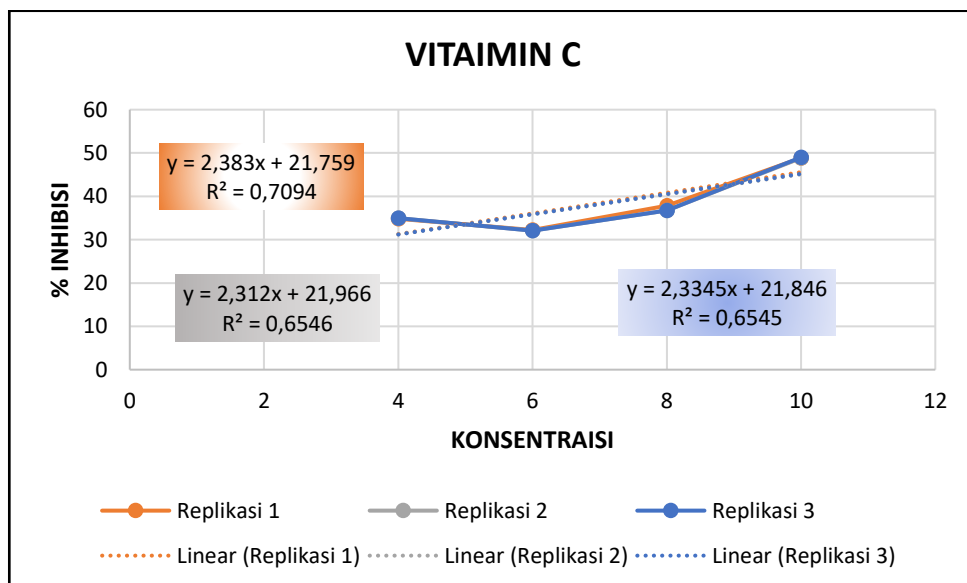
D. Kurva Antioksidan F2



E. Kurva Antioksidan F3



F. Kurva Antioksidan Vitamin C



G. Uji Statistik one-way ANOVA Antioksidan

Multiple Comparisons						
Dependent Variable: ANTIOXIDANT						
Tukey HSD						
(I) FORMULA	(J) FORMULA	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
F0	F1	170.03667*	1.45284	.000	165.2553	174.8181
	F2	176.82333*	1.45284	.000	172.0419	181.6047
	F3	179.19000*	1.45284	.000	174.4086	183.9714
	VIT C	178.25667*	1.45284	.000	173.4753	183.0381
F1	F0	-170.03667*	1.45284	.000	-174.8181	-165.2553
	F2	6.78667*	1.45284	.006	2.0053	11.5681
	F3	9.15333*	1.45284	.001	4.3719	13.9347
	VIT C	8.22000*	1.45284	.002	3.4386	13.0014
F2	F0	-176.82333*	1.45284	.000	-181.6047	-172.0419
	F1	-6.78667*	1.45284	.006	-11.5681	-2.0053
	F3	2.36667	1.45284	.513	-2.4147	7.1481
	VIT C	1.43333	1.45284	.855	-3.3481	6.2147
F3	F0	-179.19000*	1.45284	.000	-183.9714	-174.4086
	F1	-9.15333*	1.45284	.001	-13.9347	-4.3719
	F2	-2.36667	1.45284	.513	-7.1481	2.4147
	VIT C	-.93333	1.45284	.964	-5.7147	3.8481
VIT C	F0	-178.25667*	1.45284	.000	-183.0381	-173.4753
	F1	-8.22000*	1.45284	.002	-13.0014	-3.4386
	F2	-1.43333	1.45284	.855	-6.2147	3.3481
	F3	.93333	1.45284	.964	-3.8481	5.7147

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

Lampiran 10. Perhitungan Uji Antioksidan

A. Pengenceran konsentrasi sampel

$$M_1 \times V_1 = M_2 \times V_2 \quad (10 \text{ ppm})$$

$$100 \times V_1 = 10 \times 5$$

$$V_1 = \frac{50}{100}$$

$$V_1 = 0,5 \text{ ml}$$

$$M_1 \times V_1 = M_2 \times V_2 \quad (8 \text{ ppm})$$

$$100 \times V_1 = 8 \times 5$$

$$V_1 = \frac{40}{100}$$

$$V_1 = 0,4 \text{ ml}$$

$$M_1 \times V_1 = M_2 \times V_2 \quad (6 \text{ ppm})$$

$$100 \times V_1 = 6 \times 5$$

$$V_1 = \frac{30}{100}$$

$$V_1 = 0,3 \text{ ml}$$

$$M_1 \times V_1 = M_2 \times V_2 \quad (4 \text{ ppm})$$

$$100 \times V_1 = 4 \times 5$$

$$V_1 = \frac{20}{100}$$

$$V_1 = 0,2 \text{ ml}$$

B. Pengenceran Konsentrasi Vitamin C

$$M_1 \times V_1 = M_2 \times V_2 \quad (10 \text{ ppm})$$

$$1000 \times V_1 = 10 \times 5$$

$$V_1 = \frac{50}{1000}$$

$$V_1 = 0,05 \text{ ml}$$

$$M_1 \times V_1 = M_2 \times V_2 \quad (8 \text{ ppm})$$

$$1000 \times V_1 = 8 \times 5$$

$$V_1 = \frac{40}{1000}$$

$$V_1 = 0,04 \text{ ml}$$

$$M_1 \times V_1 = M_2 \times V_2 \quad (6 \text{ ppm})$$

$$1000 \times V_1 = 6 \times 5$$

$$V_1 = \frac{30}{1000}$$

$$V_1 = 0,03 \text{ ml}$$

$$M_1 \times V_1 = M_2 \times V_2 \quad (4 \text{ ppm})$$

$$1000 \times V_1 = 4 \times 5$$

$$V_1 = \frac{20}{1000}$$

$$V_1 = 0,02 \text{ ml}$$

C. Perhitungan % inhibisi

RUMUS:

$\% \text{ Inhibisi} = \frac{(\text{Abs.blanko} - \text{Abs.sampel})}{\text{Abs.blanko}} \times 100 \%$

1. Formula 0

Replikasi 1 4 ppm

$$\begin{aligned} \% \text{ Inhibisi} &= \frac{(1,065 - 1,011)}{1,065} \times 100 \% \\ &= 5,07 \% \end{aligned}$$

Replikasi 2 4 ppm

$$\begin{aligned} \% \text{ Inhibisi} &= \frac{(1,065 - 1,017)}{1,065} \times 100 \% \\ &= 4,50 \% \end{aligned}$$

Replikasi 3 4 ppm

$$\begin{aligned} \% \text{ Inhibisi} &= \frac{(1,065 - 1,015)}{1,065} \times 100 \% \\ &= 4,69 \% \end{aligned}$$

Replikasi 1 6 ppm

$$\begin{aligned} \% \text{ Inhibisi} &= \frac{(1,065 - 1,001)}{1,065} \times 100 \% \\ &= 6,00 \% \end{aligned}$$

Replikasi 2 6 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,998)}{1,065} \times 100 \% \\ &= 6,29 \%\end{aligned}$$

Replikasi 3 6 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,999)}{1,065} \times 100 \% \\ &= 6,19 \%\end{aligned}$$

Replikasi 1 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,897)}{1,065} \times 100 \% \\ &= 15,77 \%\end{aligned}$$

Replikasi 2 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,900)}{1,065} \times 100 \% \\ &= 15,49 \%\end{aligned}$$

Replikasi 3 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,901)}{1,065} \times 100 \% \\ &= 15,39 \%\end{aligned}$$

Replikasi 1 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,830)}{1,065} \times 100 \% \\ &= 22,06 \%\end{aligned}$$

Replikasi 2 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,823)}{1,065} \times 100 \% \\ &= 22,72 \%\end{aligned}$$

Replikasi 3 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,820)}{1,065} \times 100 \% \\ &= 23,00 \%\end{aligned}$$

2. Formula 1

Replikasi 1 4 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,795)}{1,065} \times 100 \% \\ &= 25,35 \%\end{aligned}$$

Replikasi 2 4 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,795)}{1,065} \times 100 \% \\ &= 25,35 \%\end{aligned}$$

Replikasi 3 4 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,793)}{1,065} \times 100 \% \\ &= 25,54 \%\end{aligned}$$

Replikasi 1 6 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,800)}{1,065} \times 100 \% \\ &= 24,88 \%\end{aligned}$$

Replikasi 2 6 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,801)}{1,065} \times 100 \% \\ &= 24,79 \%\end{aligned}$$

Replikasi 3 6 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,801)}{1,065} \times 100 \% \\ &= 24,79 \%\end{aligned}$$

Replikasi 1 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,783)}{1,065} \times 100 \% \\ &= 26,48 \%\end{aligned}$$

Replikasi 2 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,784)}{1,065} \times 100 \% \\ &= 26,38 \%\end{aligned}$$

Replikasi 3 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,786)}{1,065} \times 100 \% \\ &= 26,19 \%\end{aligned}$$

Replikasi 1 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,682)}{1,065} \times 100 \% \\ &= 35,96 \%\end{aligned}$$

Replikasi 2 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,682)}{1,065} \times 100 \% \\ &= 35,96 \%\end{aligned}$$

Replikasi 3 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,682)}{1,065} \times 100 \% \\ &= 35,96 \%\end{aligned}$$

3. Formula 2

Replikasi 1 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,682)}{1,065} \times 100 \% \\ &= 35,96 \%\end{aligned}$$

Replikasi 2 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,682)}{1,065} \times 100 \% \\ &= 35,96 \%\end{aligned}$$

Replikasi 3 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,682)}{1,065} \times 100 \% \\ &= 35,96 \%\end{aligned}$$

Replikasi 1 4 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,710)}{1,065} \times 100 \% \\ &= 33,33 \%\end{aligned}$$

Replikasi 2 4 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,710)}{1,065} \times 100 \% \\ &= 33,33 \%\end{aligned}$$

Replikasi 3 4 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,711)}{1,065} \times 100 \% \\ &= 33,24 \%\end{aligned}$$

Replikasi 1 6 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,760)}{1,065} \times 100 \% \\ &= 28,64 \%\end{aligned}$$

Replikasi 2 6 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,761)}{1,065} \times 100 \% \\ &= 28,54 \%\end{aligned}$$

Replikasi 3 6 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,761)}{1,065} \times 100 \% \\ &= 28,54 \%\end{aligned}$$

Replikasi 1 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,744)}{1,065} \times 100 \% \\ &= 30,14 \%\end{aligned}$$

Replikasi 2 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,744)}{1,065} \times 100 \% \\ &= 30,14 \%\end{aligned}$$

Replikasi 3 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,744)}{1,065} \times 100 \% \\ &= 30,14 \%\end{aligned}$$

Replikasi 1 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,552)}{1,065} \times 100 \% \\ &= 48,16 \%\end{aligned}$$

Replikasi 2 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,551)}{1,065} \times 100 \% \\ &= 48,26 \%\end{aligned}$$

Replikasi 3 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,551)}{1,065} \times 100 \% \\ &= 48,26 \%\end{aligned}$$

4. Formula 3

Replikasi 1 4 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,809)}{1,065} \times 100 \% \\ &= 24,04 \%\end{aligned}$$

Replikasi 2 4 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,809)}{1,065} \times 100 \% \\ &= 24,04 \%\end{aligned}$$

Replikasi 3 4 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,809)}{1,065} \times 100 \% \\ &= 24,04 \%\end{aligned}$$

Replikasi 1 6 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,764)}{1,065} \times 100 \% \\ &= 28,26 \%\end{aligned}$$

Replikasi 2 6 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,765)}{1,065} \times 100 \% \\ &= 28,16 \%\end{aligned}$$

Replikasi 3 6 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,773)}{1,065} \times 100 \% \\ &= 27,42 \%\end{aligned}$$

Replikasi 1 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,631)}{1,065} \times 100 \% \\ &= 40,75 \%\end{aligned}$$

Replikasi 2 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,634)}{1,065} \times 100 \% \\ &= 40,47 \%\end{aligned}$$

Replikasi 3 8 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,635)}{1,065} \times 100 \% \\ &= 40,38 \%\end{aligned}$$

Replikasi 1 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,582)}{1,065} \times 100 \% \\ &= 45,35 \%\end{aligned}$$

Replikasi 2 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,581)}{1,065} \times 100 \% \\ &= 45,45 \%\end{aligned}$$

Replikasi 3 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(1,065-0,586)}{1,065} \times 100 \% \\ &= 44,98 \%\end{aligned}$$

5. Vitamin C

Replikasi 1 4 ppm

$$\% \text{ Inhibisi} = \frac{(0,692-0,451)}{0,692} \times 100 \%$$

$$= 34,83 \%$$

Replikasi 2 4 ppm

$$\% \text{ Inhibisi} = \frac{(0,692-0,450)}{0,692} \times 100 \%$$

$$= 34,97 \%$$

Replikasi 3 4 ppm

$$\% \text{ Inhibisi} = \frac{(0,692-0,450)}{0,692} \times 100 \%$$

$$= 34,97 \%$$

Replikasi 1 6 ppm

$$\% \text{ Inhibisi} = \frac{(0,692-0,469)}{0,692} \times 100 \%$$

$$= 32,23 \%$$

Replikasi 2 6 ppm

$$\% \text{ Inhibisi} = \frac{(0,692-0,470)}{0,692} \times 100 \%$$

$$= 32,08 \%$$

Replikasi 3 6 ppm

$$\% \text{ Inhibisi} = \frac{(0,692-0,470)}{0,692} \times 100 \%$$

$$= 32,08 \%$$

Replikasi 1 8 ppm

$$\% \text{ Inhibisi} = \frac{(0,692-0,430)}{0,692} \times 100 \%$$

$$= 37,86 \%$$

Replikasi 2 8 ppm

$$\% \text{ Inhibisi} = \frac{(0,692-0,438)}{0,692} \times 100 \%$$

$$= 36,71 \%$$

Replikasi 3 8 ppm

$$\% \text{ Inhibisi} = \frac{(0,692-0,438)}{0,692} \times 100 \%$$

$$= 36,71 \%$$

Replikasi 1 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(0,692-0,354)}{0,692} \times 100 \% \\ &= 48,84 \%\end{aligned}$$

Replikasi 2 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(0,692-0,353)}{0,692} \times 100 \% \\ &= 48,99 \%\end{aligned}$$

Replikasi 3 10 ppm

$$\begin{aligned}\% \text{ Inhibisi} &= \frac{(0,692-0,354)}{0,692} \times 100 \% \\ &= 48,84 \%\end{aligned}$$

D. Perhitungan Nilai IC50

1. Formula 0

Replikasi 1

$$\begin{aligned}y &= 0,3037x - 9,034 \\ x &= \frac{(50 + b)}{a} \\ &= \frac{(50 + 9,034)}{0,3037} \\ &= 194,38 \text{ } \mu\text{g/mL}\end{aligned}$$

Replikasi 2

$$\begin{aligned}y &= 0,3193x - 10,101 \\ x &= \frac{(50 + b)}{a} \\ &= \frac{(50 + 10,101)}{0,3193} \\ &= 188,23 \text{ } \mu\text{g/mL}\end{aligned}$$

Replikasi 3

$$\begin{aligned}y &= 0,3207x - 10,128 \\ x &= \frac{(50 + b)}{a} \\ &= \frac{(50 + 10,128)}{0,3207} \\ &= 187,49 \text{ } \mu\text{g/mL}\end{aligned}$$

2. Formula 1

Replikasi 1

$$\begin{aligned}y &= 1,6665x + 16,477 \\x &= \frac{(50 - b)}{a} \\&= \frac{(50 - 16,477)}{1,6665} \\&= 20,11 \text{ } \mu\text{g/mL}\end{aligned}$$

Replikasi 2

$$\begin{aligned}y &= 1,6615x + 16,442 \\x &= \frac{(50 - b)}{a} \\&= \frac{(50 - 16,442)}{1,6615} \\&= 20,19 \text{ } \mu\text{g/mL}\end{aligned}$$

Replikasi 3

$$\begin{aligned}y &= 1,633x + 16,689 \\x &= \frac{(50 - b)}{a} \\&= \frac{(50 - 16,689)}{1,633} \\&= 20,39 \text{ } \mu\text{g/mL}\end{aligned}$$

3. Formula 2

Replikasi 1

$$\begin{aligned}y &= 2,2995x + 18,971 \\x &= \frac{(50 - b)}{a} \\&= \frac{(50 - 18,971)}{2,2995} \\&= 13,49 \text{ } \mu\text{g/mL}\end{aligned}$$

Replikasi 2

$$\begin{aligned}y &= 2,3195x + 18,831 \\x &= \frac{(50 - b)}{a} \\&= \frac{(50 - 18,831)}{2,3195}\end{aligned}$$

$$= 13,44 \text{ } \mu\text{g/mL}$$

Replikasi 3

$$y = 2,333x + 18,714$$

$$\begin{aligned} x &= \frac{(50 - b)}{a} \\ &= \frac{(50 - 18,714)}{2,3333} \\ &= 13,41 \text{ } \mu\text{g/mL} \end{aligned}$$

4. Formula 3

Replikasi 1

$$y = 3,821x + 7,853$$

$$\begin{aligned} x &= \frac{(50 - b)}{a} \\ &= \frac{(50 - 7,853)}{3,821} \\ &= 11,03 \text{ } \mu\text{g/mL} \end{aligned}$$

Replikasi 2

$$y = 3,827x + 7,741$$

$$\begin{aligned} x &= \frac{(50 - b)}{a} \\ &= \frac{(50 - 7,741)}{3,827} \\ &= 11,04 \text{ } \mu\text{g/mL} \end{aligned}$$

Replikasi 3

$$y = 3,789x + 7,682$$

$$\begin{aligned} x &= \frac{(50 - b)}{a} \\ &= \frac{(50 - 7,682)}{3,789} \\ &= 11,17 \text{ } \mu\text{g/mL} \end{aligned}$$

5. Vitamin C

Replikasi 1

$$y = 2,383x + 21,759$$

$$x = \frac{(50 - b)}{a}$$

$$= \frac{(50 - 21,759)}{2,383}$$

$$= 11,85 \text{ } \mu\text{g/mL}$$

Replikasi 2

$$y = 2,312x + 21,966$$

$$x = \frac{(50 - b)}{a}$$

$$= \frac{(50 - 21,966)}{2,312}$$

$$= 12,13 \text{ } \mu\text{g/mL}$$

Replikasi 3

$$y = 2,3345x + 21,846$$

$$x = \frac{(50 - b)}{a}$$

$$= \frac{(50 - 21,846)}{2,3345}$$

$$= 12,06 \text{ } \mu\text{g/mL}$$

Lampiran 11. Lembar Konsultasi Pembimbing I

KONSULTASI DAN MONITORING KARYA TULIS ILMIAH

Nama	Nur Rahmadani Atsman		
Nomor Induk Mahasiswa	221320059		
Program Studi	S1 Farmasi		
Nama Dosen Pembimbing	1. Apt. Al Syahni Sami, S. Farm., M. Pi 2.		
Tanggal Berita Acara Seminar UP			
Judul Karya tulis ilmiah: <u>Formulasi Serum Rambut Berbasis Minyak Alpukat (<i>Persea americana</i>): Evaluasi Stabilitas Fisik dan Uji Aktivitas Antikanker</u>			
No	Tanggal	Arahan Pembimbing/Prodi	Tanda Tangan Pembimbing
1.	23/07/2025	Perbaiki format sampul, tujuan penelitian, daftar pustaka	
2.	30/07/2025	Perbaiki tujuan penelitian	
3.	13/08/2025	Perbaiki kerangka konseptual, kerangka teori	
4.	15/08/2025	ACC proposal	
5.	27/04/2026	Revisi Hasil penelitian Bab 4	
6.	4/05/2026	Revisi Kesimpulan	
7.	5/05/2026	Revisi daftar pustaka	
8.	8/05/2026	Revisi lampiran	
9.	9/05/2026	Revisi abstrak dan Acc	

Ket: *)Melampirkan bukti bimbingan jika tanpa tutup muka.

Cat: Halaman berikutnya mulai dari judul kolom, dapat ditambah sesuai kebutuhan.

Palopo,

Ketua Program Studi Ilmu

NIP/NIDN.

Lampiran 12. Lembar Konsultasi Pembimbing II

KONSULTASI DAN MONITORING KARYA TULIS ILMIAH

Nama	Nur Rahmadani Atgoran		
Nomor Induk Mahasiswa	22122059		
Program Studi	P1 Farmasi		
Nama Dosen Pembimbing	1. 2. Dr. apt. Andi Nakhiani, U. Mars., M. Kes		
Tanggal Berita Acara Seminar UP			
Judul Karya tulis ilmiah:	Formulasi Serum Rambut Berbasis Minyak Alpukat (<i>Persea americana</i>): Evaluasi Stabilitas Fisik dan Uji Aktivitas Antioksidan		
No	Tanggal	Arahan Pembimbing/Prodi	Tanda Tangan Pembimbing
1.	5/8/2025	Perbaiki penulisan Bab 1 dan Bab 2	
2.	11/8/2025	Perbaiki format daftar pustaka	
3.	15/8/2025	Acc proposal	
4.	29/9/2026	Revisi Bab 1	
5.	30/4/2026	Revisi daftar tabel dan daftar gambar	
6.	7/5/2026	Revisi lampiran dan ACC	

Ket: *)Melampirkan bukti bimbingan jika tanpa tatap muka.

Cat: Halaman berikutnya mulai dari judul kolom, dapat ditambah sesuai kebutuhan.

Palopo,

Ketua Program Studi Ilmu

.....
NIP/NIDN.