

LAMPIRAN

Lampiran 1. Perhitungan Formulasi Sediaan Lip Balm

1. Formula 0 (Basis)

$$\text{Propilen glikol} = \frac{5}{100} \times 50 = 2,5 \text{ gr}$$

$$\text{Cera alba} = \frac{11}{100} \times 50 = 5,5 \text{ gr}$$

$$\text{Nipagin} = \frac{0,2}{100} \times 50 = 0,1 \text{ gr}$$

$$\text{BHT} = \frac{0,05}{100} \times 50 = 0,025 \text{ gr}$$

$$\text{Tween 80} = \frac{2}{100} \times 50 = 1 \text{ gr}$$

$$\begin{aligned} \text{Oleum cacao} &= 50 - (2,5 + 5,5 + 0,1 + 0,025 + 1) \\ &= 50 - 9,125 \\ &= 40,875 \text{ gr} \end{aligned}$$

2. Formula 1

$$\text{Minyak atsiri} = \frac{2}{100} \times 50 = 1 \text{ gr}$$

$$\text{Propilen glikol} = \frac{5}{100} \times 50 = 2,5 \text{ gr}$$

$$\text{Cera alba} = \frac{11}{100} \times 50 = 5,5 \text{ gr}$$

$$\text{Nipagin} = \frac{0,2}{100} \times 50 = 0,1 \text{ gr}$$

$$\text{BHT} = \frac{0,05}{100} \times 50 = 0,025 \text{ gr}$$

$$\text{Tween 80} = \frac{2}{100} \times 50 = 1 \text{ gr}$$

$$\begin{aligned} \text{Oleum cacao} &= 50 - (1 + 2,5 + 5,5 + 0,1 + 0,025 + 1) \\ &= 50 - 10,125 \\ &= 39,875 \text{ gr} \end{aligned}$$

3. Formulasi 2

$$\text{Minyak atsiri} = \frac{4}{100} \times 50 = 2 \text{ gr}$$

$$\begin{aligned}
 \text{Propilen glikol} &= \frac{5}{100} \times 50 = 2,5 \text{ gr} \\
 \text{Cera alba} &= \frac{11}{100} \times 50 = 5,5 \text{ gr} \\
 \text{Nipagin} &= \frac{0,2}{100} \times 50 = 0,1 \text{ gr} \\
 \text{BHT} &= \frac{0,05}{100} \times 50 = 0,025 \text{ gr} \\
 \text{Tween 80} &= \frac{2}{100} \times 50 = 1 \text{ gr} \\
 \text{Oleum cacao} &= 50 - (2 + 2,5 + 5,5 + 0,1 + 0,025 + 1) \\
 &= 50 - 11,125 \\
 &= 38,875 \text{ gr}
 \end{aligned}$$

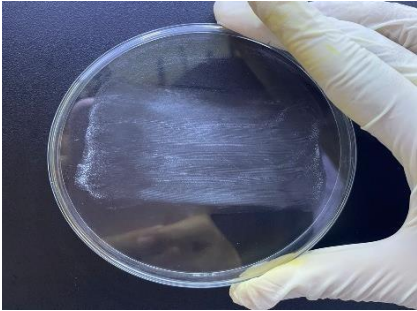
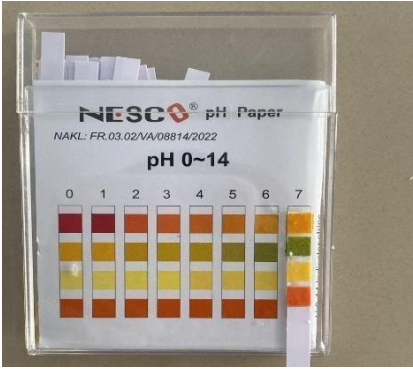
4. Formulasi 3

$$\begin{aligned}
 \text{Minyak atsiri} &= \frac{6}{100} \times 50 = 3 \text{ gr} \\
 \text{Propilen glikol} &= \frac{5}{100} \times 50 = 2,5 \text{ gr} \\
 \text{Cera alba} &= \frac{11}{100} \times 50 = 5,5 \text{ gr} \\
 \text{Nipagin} &= \frac{0,2}{100} \times 50 = 0,1 \text{ gr} \\
 \text{BHT} &= \frac{0,05}{100} \times 50 = 0,025 \text{ gr} \\
 \text{Tween 80} &= \frac{2}{100} \times 50 = 1 \text{ gr} \\
 \text{Oleum cacao} &= 50 - (3 + 2,5 + 5,5 + 0,1 + 0,025 + 1) \\
 &= 50 - 12,125 \\
 &= 37,875 \text{ gr}
 \end{aligned}$$

Lampiran 2. Proses Pembuatan Sediaan Lip Balm

Gambar	Keterangan
	Penyiapan alat dan bahan pembuatan sediaan lip balm
	Proses peleburan bahan diatas pemanas dengan suhu 31-34°C
	Proses pencampuran semua bahan
	Tampak sediaan setelah dibuat dan mengeras

Lampiran 3. Pengujian Stabilitas Fisik Sediaan Lip Balm

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

	Pengujian iritasi dan hedonik sediaan
	Hasil pengujian iritasi

Populasi yang digunakan yaitu mahasiswa/i angkatan VI (6) prodi farmasi Universitas Muhammadiyah Palopo dengan jumlah 61 orang.

$$\text{Rumus : } n = \frac{N}{1+N(e)^2}$$

Keterangan :

N = Populasi

E = Error (%)

$$\begin{aligned}
 \text{Perhitungan : } n &= \frac{N}{1+N(e)^2} \\
 &= \frac{61}{1+61(20\%)^2} \\
 &= \frac{61}{1+61(0,2)^2} \\
 &= \frac{61}{1+61(0,04)} \\
 &= \frac{61}{1+2,44} \\
 &= \frac{61}{3,44} \\
 &= 17
 \end{aligned}$$

Lampiran 4. Kuisisioner Uji Iritasi

KUISISIONER UJI IRITASI

Nama

U.

Jenis Kelamin : Perempuan

Hari/Tanggal : Kamis / 9 April 2026

Nama Produk : Lip Balm Minyak Atsiri Daun Rosemary (*Rosmarinus officinalis* L)

INSTRUKSI

Dihadapan saudara/i terdapat 4 sediaan Lip Balm berkode F0, F1, F2, dan F3 saudara/i diminta untuk menilai sediaan apakah mengiritasi dengan cara mengoleskan sediaan pada pergelangan tangan saudara/i seluas 2,5cm kemudian dibiarkan selama 5 menit. Adapun kriteria untuk penilaian sebagai berikut :

Tabel I. Kriteria penelitian uji iritasi sediaan Lip Balm

Kriteria	Penilaian	Skor	Keterangan
Mengiritasi	+++	2	Kemerahan, panas, gatal-gatal, bengkak
Sedikit mengiritasi	++	1	Kemerahan, panas, gatal-gatal, tidak bengkak
Tidak mengiritasi	+	0	Tidak menimbulkan kemerahan, panas, gatal-gatal, dan tidak bengkak

Petunjuk pengisian : setelah selesai melakukan pengujian, silahkan mengisi pada kolom penilaian saudara/i dengan tanda (+++, ++, +).

Tabel II. Penilaian uji iritasi

Kode			
F0	F1	F2	F3
+	++	++	++

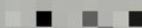
Terimakasih atas bantuan dan waktu yang telah Anda sediakan

Palopo, 9 April 2026

(.....)

Lampiran 5. Kuisisioner Uji Hedonik

KUISISIONER UJI HEDONIK (KESUKAAN)

Nama : 

Umur : 

Jenis Kelamin : Perempuan

Hari/Tanggal : Kamis / 9 April 2026

Nama Produk : Lip Balm Minyak Atsiri Daun Rosemary (*Rosmarinus officinalis* L)

PETUNJUK PENGISIAN

1. Panelis diberikan 3 formula lip balm minyak atsiri oleh peneliti.
2. Setiap sediaan dioleskan pada punggung tangan panelis secara bertahap dengan mengamati warna, bau, tekstur, kehalusan, kemudahan menyerap, dan kemudahan menyebar dari sediaan.
3. Panelis memberikan penilaian terhadap masing-masing formula dengan memberikan nilai. Adapun kriteria penilaian :
 - a. 1 (sangat tidak suka)
 - b. 2 (tidak suka)
 - c. 3 (netral/biasa)
 - d. 4 (suka)
 - e. 5 (sangat suka)

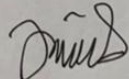
Petunjuk pengisian : setelah selesai melakukan pengujian, silahkan mengisi pada kolom penilaian saudara/i dengan tanda (1,2,3,4,5)

No.	Karakteristik	Tingkat Kesukaan			
		F0	F1	F2	F3
1.	Warna	4	4	4	4
2.	Bau	4	4	3	3
3.	Tekstur	3	3	3	3

Produk yang paling disukai : (.....)

Terimakasih atas bantuan dan waktu yang telah Anda sediakan

Palopo, 09 April2026


(.....)

Lampiran 6. Hasil Uji Hedonik Sediaan Lip Balm

1. Perhitungan Uji Hedonik

$$\text{RUMUS : } M = \frac{\sum x}{N}$$

a. Warna

Formula 0

$$\begin{aligned} \text{Netral} &= \frac{2}{17} \times 100\% \\ &= 12\% \end{aligned}$$

$$\begin{aligned} \text{Suka} &= \frac{10}{17} \times 100\% \\ &= 59\% \end{aligned}$$

$$\begin{aligned} \text{Sangat Suka} &= \frac{5}{17} \times 100\% \\ &= 29\% \end{aligned}$$

$$\begin{aligned} \text{Rata-Rata Total} &= \frac{(2 \times 3) + (10 \times 4) + (5 \times 5)}{17} \\ &= \frac{71}{17} \\ &= 4,17 \end{aligned}$$

Formula 1

$$\begin{aligned} \text{Netral} &= \frac{1}{17} \times 100\% \\ &= 6\% \end{aligned}$$

$$\begin{aligned} \text{Suka} &= \frac{13}{17} \times 100\% \\ &= 76\% \end{aligned}$$

$$\begin{aligned} \text{Sangat Suka} &= \frac{3}{17} \times 100\% \\ &= 18\% \end{aligned}$$

$$\begin{aligned} \text{Rata-Rata Total} &= \frac{(1 \times 3) + (13 \times 4) + (3 \times 5)}{17} \\ &= \frac{70}{17} \\ &= 4 \end{aligned}$$

Formula 2

$$\begin{aligned}\text{Netral} &= \frac{3}{17} \times 100\% \\ &= 18\%\end{aligned}$$

$$\begin{aligned}\text{Suka} &= \frac{11}{17} \times 100\% \\ &= 65\%\end{aligned}$$

$$\begin{aligned}\text{Sangat Suka} &= \frac{3}{17} \times 100\% \\ &= 18\%\end{aligned}$$

$$\begin{aligned}\text{Rata-Rata Total} &= \frac{(3 \times 3) + (11 \times 4) + (3 \times 5)}{17} \\ &= \frac{68}{17} \\ &= 4\end{aligned}$$

Formula 3

$$\begin{aligned}\text{Netral} &= \frac{1}{17} \times 100\% \\ &= 6\%\end{aligned}$$

$$\begin{aligned}\text{Suka} &= \frac{10}{17} \times 100\% \\ &= 71\%\end{aligned}$$

$$\begin{aligned}\text{Sangat Suka} &= \frac{5}{17} \times 100\% \\ &= 24\%\end{aligned}$$

$$\begin{aligned}\text{Rata-Rata Total} &= \frac{(1 \times 3) + (10 \times 4) + (5 \times 5)}{17} \\ &= \frac{71}{17} \\ &= 4,2\end{aligned}$$

b. Aroma

Formula 0

$$\begin{aligned}\text{Netral} &= \frac{2}{17} \times 100\% \\ &= 12\%\end{aligned}$$

$$\begin{aligned}\text{Suka} &= \frac{11}{17} \times 100\% \\ &= 65\%\end{aligned}$$

$$= 65\%$$

$$\text{Sangat Suka} = \frac{7}{17} \times 100\%$$

$$= 24\%$$

$$\text{Rata-Rata Total} = \frac{(2 \times 3) + (11 \times 4) + (4 \times 5)}{17}$$

$$= \frac{70}{17}$$

$$= 4,11$$

Formula 1

$$\text{Netral} = \frac{3}{17} \times 100\%$$

$$= 18\%$$

$$\text{Suka} = \frac{10}{17} \times 100\%$$

$$= 59\%$$

$$\text{Sangat Suka} = \frac{4}{17} \times 100\%$$

$$= 24\%$$

$$\text{Rata-Rata Total} = \frac{(3 \times 3) + (10 \times 4) + (4 \times 5)}{17}$$

$$= \frac{69}{17}$$

$$= 4,05$$

Formula 2

$$\text{Netral} = \frac{4}{17} \times 100\%$$

$$= 24\%$$

$$\text{Suka} = \frac{10}{17} \times 100\%$$

$$= 59\%$$

$$\text{Sangat Suka} = \frac{3}{17} \times 100\%$$

$$= 18\%$$

$$\text{Rata-Rata Total} = \frac{(4 \times 3) + (10 \times 4) + (3 \times 5)}{17}$$

$$= \frac{67}{17}$$

$$= 3,94$$

Formula 3

$$\text{Netral} = \frac{1}{17} \times 100\%$$

$$= 6\%$$

$$\text{Suka} = \frac{9}{17} \times 100\%$$

$$= 53\%$$

$$\text{Sangat Suka} = \frac{7}{17} \times 100\%$$

$$= 41\%$$

$$\text{Rata-Rata Total} = \frac{(1 \times 3) + (9 \times 4) + (7 \times 5)}{17}$$

$$= \frac{74}{17}$$

$$= 4,35$$

c. Tekstur

Formula 0

$$\text{Netral} = \frac{6}{17} \times 100\%$$

$$= 35\%$$

$$\text{Suka} = \frac{5}{17} \times 100\%$$

$$= 29\%$$

$$\text{Sangat Suka} = \frac{6}{17} \times 100\%$$

$$= 35\%$$

$$\text{Rata-Rata Total} = \frac{(6 \times 3) + (5 \times 4) + (6 \times 5)}{17}$$

$$= \frac{68}{17}$$

$$= 4$$

Formula 1

$$\begin{aligned}\text{Netral} &= \frac{3}{17} \times 100\% \\ &= 29\%\end{aligned}$$

$$\begin{aligned}\text{Suka} &= \frac{7}{17} \times 100\% \\ &= 41\%\end{aligned}$$

$$\begin{aligned}\text{Sangat Suka} &= \frac{5}{17} \times 100\% \\ &= 29\%\end{aligned}$$

$$\begin{aligned}\text{Rata-Rata Total} &= \frac{(3 \times 5) + (7 \times 4) + (5 \times 5)}{17} \\ &= \frac{68}{17} \\ &= 4\end{aligned}$$

Formula 2

$$\begin{aligned}\text{Netral} &= \frac{7}{17} \times 100\% \\ &= 41\%\end{aligned}$$

$$\begin{aligned}\text{Suka} &= \frac{6}{17} \times 100\% \\ &= 35\%\end{aligned}$$

$$\begin{aligned}\text{Sangat Suka} &= \frac{4}{17} \times 100\% \\ &= 24\%\end{aligned}$$

$$\begin{aligned}\text{Rata-Rata Total} &= \frac{(7 \times 3) + (6 \times 4) + (4 \times 5)}{17} \\ &= \frac{65}{17} \\ &= 3,83\end{aligned}$$

Formula 3

$$\begin{aligned}\text{Netral} &= \frac{5}{17} \times 100\% \\ &= 29\%\end{aligned}$$

$$\begin{aligned}\text{Suka} &= \frac{5}{17} \times 100\% \\ &= 29\%\end{aligned}$$

$$= 29\%$$

$$\text{Sangat Suka} = \frac{7}{17} \times 100\%$$

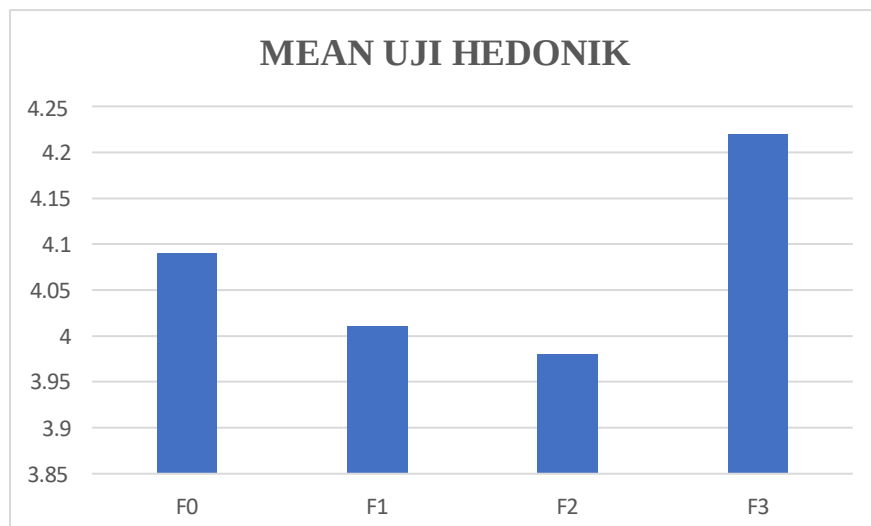
$$= 41\%$$

$$\text{Rata-Rata Total} = \frac{(5 \times 3) + (5 \times 4) + (7 \times 5)}{17}$$

$$= \frac{70}{17}$$

$$= 4,11$$

2. Diagram Mean Uji Hedonik



Lampiran 7. Pengujian Aktivitas Antioksidan Sediaan Lip Balm

Gambar	Keterangan
	Larutan sampel
	Pencampuran larutan blanko dan diinkubasi
	Pengukuran absorbansi sampel

Lampiran 8. Perhitungan Pengujian Antioksidan

1. Pengenceran Larutan Pembanding dan Sampel

Rumus : $V1.M1 = V2.M2$

Diketahui = $V1$ = Konsentrasi awal

$V2$ = Konsentrasi yang di inginkan

$M1$ = Volume larutan yang diambil

$M2$ = Volume setelah pengenceran

a. Pengenceran Larutan Vit C 10 ppm

Dik : $V1 = 1000\text{ppm}$

$V2 = 10\text{ppm}, 8\text{ppm}, 6\text{ppm}, 4\text{ppm}$

$M2 = 5\text{ml}$

Dit : $M1$?

$$\begin{aligned} 10 \text{ ppm} &= V1.M1 = V2.M2 \\ &= 1000.M1 = 10.5 \\ &= 0,05\text{ml} + 4,95\text{ml metanol} \end{aligned}$$

$$\begin{aligned} 8 \text{ ppm} &= V1.M1 = V2.M2 \\ &= 10.M1 = 8.5 \\ &= 0,04\text{ml} + 4,96\text{ml metanol} \end{aligned}$$

$$\begin{aligned} 6 \text{ ppm} &= V1.M1 = V2.M2 \\ &= 8.M1 = 6.5 \\ &= 3,75\text{ml} + 1,25\text{ml metanol} \end{aligned}$$

$$\begin{aligned} 4 \text{ ppm} &= V1.M1 = V2.M2 \\ &= 6.M1 = 4.5 \\ &= 3,3\text{ml} + 1,7\text{ml metanol} \end{aligned}$$

b. Pengenceran Larutan Sampel F0 10ppm

Dik : $V1 = 1000\text{ppm}$

$V2 = 10 \text{ ppm}, 8\text{ppm}, 6\text{ppm}, 4\text{ppm}$

$M2 = 5\text{ml}$

Dit : $M1$?

$$\begin{aligned} 10 \text{ ppm} &= V1.M1 = V2.M2 \\ &= 1000.M1 = 10.5 \\ &= 0,05\text{ml} + 4,95\text{ml metanol} \end{aligned}$$

$$\begin{aligned} 8 \text{ ppm} &= V1.M1 = V2.M2 \\ &= 10.M1 = 8.5 \\ &= 4\text{ml} + 1\text{ml metanol} \end{aligned}$$

$$\begin{aligned} 6 \text{ ppm} &= V1.M1 = V2.M2 \\ &= 8.M1 = 6.5 \\ &= 3,75\text{ml} + 1,25\text{ml metanol} \end{aligned}$$

$$4 \text{ ppm} = V1.M1 = V2.M2$$

$$= 6.M1 = 4.5$$

$$= 3,3\text{ml} + 1,7\text{ml metanol}$$

c. Pengenceran Larutan Sampel F1 10ppm

Dik : $V1 = 1000\text{ppm}$
 $V2 = 10\text{ppm}, 8\text{ppm}, 6\text{ppm}, 4\text{ppm}$
 $M2 = 5\text{ml}$

Dit : $M1$?

$$10 \text{ ppm} = V1.M1 = V2.M2$$

$$= 1000.M1 = 10.5$$

$$= 0,05\text{ml} + 4,95\text{ml metanol}$$

$$8 \text{ ppm} = V1.M1 = V2.M2$$

$$= 10.M1 = 8.5$$

$$= 4\text{ml} + 1\text{ml metanol}$$

$$6 \text{ ppm} = V1.M1 = V2.M2$$

$$= 8.M1 = 6.5$$

$$= 3,75\text{ml} + 1,25\text{ml metanol}$$

$$4 \text{ ppm} = V1.M1 = V2.M2$$

$$= 6.M1 = 4.5$$

$$= 3,3\text{ml} + 1,7\text{ml metanol}$$

d. Pengenceran Larutan Sampel F2 10ppm

Dik : $V1 = 1000\text{ppm}$
 $V2 = 10\text{ppm}, 8\text{ppm}, 6\text{ppm}, 4\text{ppm}$
 $M2 = 5\text{ml}$

Dit : $M1$?

$$10 \text{ ppm} = V1.M1 = V2.M2$$

$$= 1000.M1 = 10.5$$

$$= 0,05\text{ml} + 4,95\text{ml metanol}$$

$$8 \text{ ppm} = V1.M1 = V2.M2$$

$$= 10.M1 = 8.5$$

$$= 4\text{ml} + 1\text{ml metanol}$$

$$6 \text{ ppm} = V1.M1 = V2.M2$$

$$= 8.M1 = 6.5$$

$$= 3,75\text{ml} + 1,25\text{ml metanol}$$

$$4 \text{ ppm} = V1.M1 = V2.M2$$

$$= 6.M1 = 4.5$$

$$= 3,3\text{ml} + 1,7\text{ml metanol}$$

e. Pengenceran Larutan Sampel F3 10ppm

Dik : $V1 = 1000\text{ppm}$
 $V2 = 10\text{ppm}, 8\text{ppm}, 6\text{ppm}, 4\text{ppm}$
 $M2 = 5\text{ml}$

Dit : M1 ?

$$\begin{aligned} 10 \text{ ppm} &= V1.M1 = V2.M2 \\ &= 1000.M1 = 10.5 \\ &= 0,05\text{ml} + 4,95\text{ml metanol} \end{aligned}$$

$$\begin{aligned} 8 \text{ ppm} &= V1.M1 = V2.M2 \\ &= 10.M1 = 8.5 \\ &= 4\text{ml} + 1\text{ml metanol} \end{aligned}$$

$$\begin{aligned} 6 \text{ ppm} &= V1.M1 = V2.M2 \\ &= 8.M1 = 6.5 \\ &= 3,75\text{ml} + 1,25\text{ml metanol} \end{aligned}$$

$$\begin{aligned} 4 \text{ ppm} &= V1.M1 = V2.M2 \\ &= 6.M1 = 4.5 \\ &= 3,3\text{ml} + 1,7\text{ml metanol} \end{aligned}$$

2. Perhitungan % Inhibisi Larutan Pembanding Vitamin C

$$\text{Rumus : \% inhibisi} = \frac{(A \text{ blanko} - A \text{ sampel})}{A \text{ blanko}} \times 100\%$$

a. Replikasi 1

$$\begin{aligned} \% \text{ inhibisi } 4 \text{ ppm} &= \frac{0,692 - 0,451}{0,692} \times 100\% \\ &= 34,82\% \end{aligned}$$

$$\begin{aligned} \% \text{ inhibisi } 6 \text{ ppm} &= \frac{0,692 - 0,469}{0,692} \times 100\% \\ &= 32,22\% \end{aligned}$$

$$\begin{aligned} \% \text{ inhibisi } 8 \text{ ppm} &= \frac{0,692 - 0,430}{0,692} \times 100\% \\ &= 37,86\% \end{aligned}$$

$$\begin{aligned} \% \text{ inhibisi } 10 \text{ ppm} &= \frac{0,692 - 0,354}{0,692} \times 100\% \\ &= 48,84\% \end{aligned}$$

b. Replikasi 2

$$\begin{aligned} \% \text{ inhibisi } 4 \text{ ppm} &= \frac{0,692 - 0,450}{0,692} \times 100\% \\ &= 34,97\% \end{aligned}$$

$$\begin{aligned} \% \text{ inhibisi } 6 \text{ ppm} &= \frac{0,692 - 0,470}{0,692} \times 100\% \end{aligned}$$

$$= 32,08\%$$

$$\% \text{ inhibisi 8 ppm} = \frac{0,692 - 0,438}{0,692} \times 100\%$$

$$= 36,70\%$$

$$\% \text{ inhibisi 10 ppm} = \frac{0,692 - 0,353}{0,692} \times 100\%$$

$$= 48,98\%$$

c. Replikasi 3

$$\% \text{ inhibisi 4 ppm} = \frac{0,692 - 0,450}{0,692} \times 100\%$$

$$= 34,97\%$$

$$\% \text{ inhibisi 6 ppm} = \frac{0,692 - 0,470}{0,692} \times 100\%$$

$$= 32,08\%$$

$$\% \text{ inhibisi 8 ppm} = \frac{0,692 - 0,438}{0,692} \times 100\%$$

$$= 36,70\%$$

$$\% \text{ inhibisi 10 ppm} = \frac{0,692 - 0,354}{0,692} \times 100\%$$

$$= 48,84\%$$

3. Perhitungan % inhibisi Sampel

1. Perhitungan % Inhibisi Formula 0

a. Replikasi 1

$$\% \text{ inhibisi 4 ppm} = \frac{0,899 - 0,809}{0,899} \times 100\%$$

$$= 10,01\%$$

$$\% \text{ inhibisi 6 ppm} = \frac{0,899 - 0,807}{0,899} \times 100\%$$

$$= 10,23\%$$

$$\% \text{ inhibisi 8 ppm} = \frac{0,899 - 0,805}{0,899} \times 100\%$$

$$= 10,45\%$$

$$\begin{aligned}\% \text{ inhibisi 10 ppm} &= \frac{0,899 - 0,802}{0,899} \times 100\% \\ &= 10,78\%\end{aligned}$$

b. Replikasi 2

$$\begin{aligned}\% \text{ inhibisi 4 ppm} &= \frac{0,899 - 0,810}{0,899} \times 100\% \\ &= 9,89\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 6 ppm} &= \frac{0,899 - 0,808}{0,899} \times 100\% \\ &= 10,12\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 8 ppm} &= \frac{0,899 - 0,805}{0,899} \times 100\% \\ &= 10,45\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 10 ppm} &= \frac{0,899 - 0,803}{0,899} \times 100\% \\ &= 10,67 \%\end{aligned}$$

c. Replikasi 3

$$\begin{aligned}\% \text{ inhibisi 4 ppm} &= \frac{0,899 - 0,811}{0,899} \times 100\% \\ &= 9,78\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 6 ppm} &= \frac{0,899 - 0,808}{0,899} \times 100\% \\ &= 10,12\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 8 ppm} &= \frac{0,899 - 0,806}{0,899} \times 100\% \\ &= 10,34\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 10 ppm} &= \frac{0,899 - 0,804}{0,899} \times 100\% \\ &= 10,56\%\end{aligned}$$

2. Perhitungan % Inhibisi Formulasi 1

a. Replikasi 1

$$\% \text{ inhibisi 4 ppm} = \frac{0,899 - 0,839}{0,899} \times 100\%$$

$$\begin{aligned}
 &= 6,67\% \\
 \% \text{ inhibisi 6 ppm} &= \frac{0,899 - 0,824}{0,899} \times 100\% \\
 &= 8,34\% \\
 \% \text{ inhibisi 8 ppm} &= \frac{0,899 - 0,800}{0,899} \times 100\% \\
 &= 11,01\% \\
 \% \text{ inhibisi 10 ppm} &= \frac{0,899 - 0,693}{0,899} \times 100\% \\
 &= 22,91\%
 \end{aligned}$$

b. Replikasi 2

$$\begin{aligned}
 \% \text{ inhibisi 4 ppm} &= \frac{0,899 - 0,837}{0,899} \times 100\% \\
 &= 6,89\% \\
 \% \text{ inhibisi 6 ppm} &= \frac{0,899 - 0,825}{0,899} \times 100\% \\
 &= 8,23\% \\
 \% \text{ inhibisi 8 ppm} &= \frac{0,899 - 0,800}{0,899} \times 100\% \\
 &= 11,01\% \\
 \% \text{ inhibisi 10 ppm} &= \frac{0,899 - 0,691}{0,899} \times 100\% \\
 &= 23,13\%
 \end{aligned}$$

c. Replikasi 3

$$\begin{aligned}
 \% \text{ inhibisi 4 ppm} &= \frac{0,899 - 0,839}{0,899} \times 100\% \\
 &= 6,67\% \\
 \% \text{ inhibisi 6 ppm} &= \frac{0,899 - 0,824}{0,899} \times 100\% \\
 &= 8,34\% \\
 \% \text{ inhibisi 8 ppm} &= \frac{0,899 - 0,800}{0,899} \times 100\% \\
 &= 11,01\%
 \end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 10 ppm} &= \frac{0,899 - 0,690}{0,899} \times 100\% \\ &= 23,24\%\end{aligned}$$

3. Perhitungan % Inhibisi Formula 2

a. Replikasi 1

$$\begin{aligned}\% \text{ inhibisi 4 ppm} &= \frac{0,899 - 0,826}{0,899} \times 100\% \\ &= 8,12\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 6 ppm} &= \frac{0,899 - 0,816}{0,899} \times 100\% \\ &= 9,23\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 8 ppm} &= \frac{0,899 - 0,794}{0,899} \times 100\% \\ &= 11,67\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 10 ppm} &= \frac{0,899 - 0,624}{0,899} \times 100\% \\ &= 30,58\%\end{aligned}$$

b. Replikasi 2

$$\begin{aligned}\% \text{ inhibisi 4 ppm} &= \frac{0,899 - 0,827}{0,899} \times 100\% \\ &= 8,00\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 6 ppm} &= \frac{0,899 - 0,819}{0,899} \times 100\% \\ &= 8,89\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 8 ppm} &= \frac{0,899 - 0,795}{0,899} \times 100\% \\ &= 11,56\%\end{aligned}$$

$$\begin{aligned}\% \text{ inhibisi 10 ppm} &= \frac{0,899 - 0,624}{0,899} \times 100\% \\ &= 30,58\%\end{aligned}$$

c. Replikasi 3

$$\% \text{ inhibisi 4 ppm} = \frac{0,899 - 0,827}{0,899} \times 100\%$$

$$\begin{aligned}
 &= 8,00\% \\
 \% \text{ inhibisi 6 ppm} &= \frac{0,899 - 0,820}{0,899} \times 100\% \\
 &= 8,78\% \\
 \% \text{ inhibisi 8 ppm} &= \frac{0,899 - 0,794}{0,899} \times 100\% \\
 &= 11,67\% \\
 \% \text{ inhibisi 10 ppm} &= \frac{0,899 - 0,624}{0,899} \times 100\% \\
 &= 30,58\%
 \end{aligned}$$

4. Perhitungan % Inhibisi Formula 3

a. Replikasi 1

$$\begin{aligned}
 \% \text{ inhibisi 4 ppm} &= \frac{0,899 - 0,828}{0,899} \times 100\% \\
 &= 7,89\% \\
 \% \text{ inhibisi 6 ppm} &= \frac{0,899 - 0,807}{0,899} \times 100\% \\
 &= 10,23\% \\
 \% \text{ inhibisi 8 ppm} &= \frac{0,899 - 0,652}{0,899} \times 100\% \\
 &= 27,47\% \\
 \% \text{ inhibisi 10 ppm} &= \frac{0,899 - 0,626}{0,899} \times 100\% \\
 &= 30,36\%
 \end{aligned}$$

b. Replikasi 2

$$\begin{aligned}
 \% \text{ inhibisi 4 ppm} &= \frac{0,899 - 0,827}{0,899} \times 100\% \\
 &= 8,00\% \\
 \% \text{ inhibisi 6 ppm} &= \frac{0,899 - 0,807}{0,899} \times 100\% \\
 &= 10,23\%
 \end{aligned}$$

$$\% \text{ inhibisi 8 ppm} = \frac{0,899 - 0,651}{0,899} \times 100\%$$

$$= 27,58\%$$

$$\% \text{ inhibisi 10 ppm} = \frac{0,899 - 0,0,626}{0,899} \times 100\%$$

$$= 30,36\%$$

c. Replikasi 3

$$\% \text{ inhibisi 4 ppm} = \frac{0,899 - 0,827}{0,899} \times 100\%$$

$$= 8,00\%$$

$$\% \text{ inhibisi 6 ppm} = \frac{0,899 - 0,807}{0,899} \times 100\%$$

$$= 10,23\%$$

$$\% \text{ inhibisi 8 ppm} = \frac{0,899 - 0,654}{0,899} \times 100\%$$

$$= 27,25\%$$

$$\% \text{ inhibisi 10 ppm} = \frac{0,899 - 0,624}{0,899} \times 100\%$$

$$= 30,58\%$$

4. Perhitungan IC_{50} Sampel

$$\text{Rumus : } IC_{50} = \frac{(50-a)}{b}$$

1. Perhitungan Nilai IC_{50} Formulasi 0 (3 replikasi)

Replikasi 1

$$IC_{50} = \frac{50 - 9,348}{0,1335}$$

$$= 304,50$$

Replikasi 2

$$IC_{50} = \frac{50 - 9,482}{0,1265}$$

$$= 320,30$$

Replikasi 3

$$\begin{aligned} \text{IC}_{50} &= \frac{50-9,304}{0,128} \\ &= 317,93 \end{aligned}$$

Rata-Rata = 314,24 (lemah)

2. Perhitungan Nilai IC_{50} Formulasi 1 (3 replikasi)

Replikasi 1

$$\begin{aligned} \text{IC}_{50} &= \frac{50+5,71}{2,575} \\ &= 21,63 \end{aligned}$$

Replikasi 2

$$\begin{aligned} \text{IC}_{50} &= \frac{50+5,46}{2,545} \\ &= 21,79 \end{aligned}$$

Replikasi 3

$$\begin{aligned} \text{IC}_{50} &= \frac{50+6,018}{2,619} \\ &= 21,38 \end{aligned}$$

Rata-Rata = 21,6 (sangat kuat)

3. Perhitungan Nilai IC_{50} Formulasi 2 (3 replikasi)

Replikasi 1

$$\begin{aligned} \text{IC}_{50} &= \frac{50+9,963}{3,5315} \\ &= 16,97 \end{aligned}$$

Replikasi 2

$$\begin{aligned} \text{IC}_{50} &= \frac{50+9,537}{3,491} \\ &= 17,05 \end{aligned}$$

Replikasi 3

$$\begin{aligned} \text{IC}_{50} &= \frac{50+9,886}{3,5205} \\ &= 17,01 \end{aligned}$$

Rata-Rata = 17,01 (sangat kuat)

4. Perhitungan Nilai IC₅₀ Formulasi 3 (3 replikasi)

Replikasi 1

$$\begin{aligned} \text{IC}_{50} &= \frac{50+10,508}{4,2215} \\ &= 14,33 \end{aligned}$$

Replikasi 2

$$\begin{aligned} \text{IC}_{50} &= \frac{50+10,64}{4,2325} \\ &= 14,32 \end{aligned}$$

Replikasi 3

$$\begin{aligned} \text{IC}_{50} &= \frac{50+10,651}{4,238} \\ &= 14,31 \end{aligned}$$

Rata-Rata = 14,32 (sangat kuat)

5. Perhitungan Nilai IC₅₀ Vitamin C

Replikasi 1

$$\begin{aligned} \text{IC}_{50} &= \frac{50-21,967}{2,3115} \\ &= 12,12 \end{aligned}$$

Replikasi 2

$$\begin{aligned} \text{IC}_{50} &= \frac{50-21,739}{2,3855} \\ &= 11,84 \end{aligned}$$

Replikasi 3

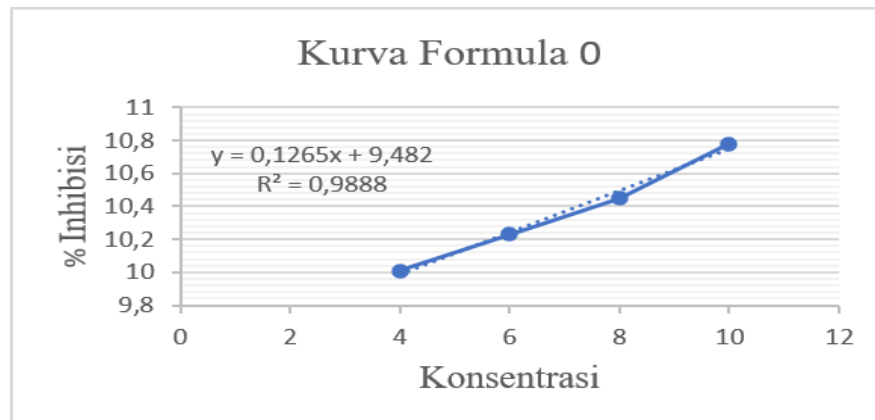
$$\begin{aligned} \text{IC}_{50} &= \frac{50-21,855}{2,3325} \\ &= 12,06 \end{aligned}$$

Rata-Rata = 12,0 (sangat kuat)

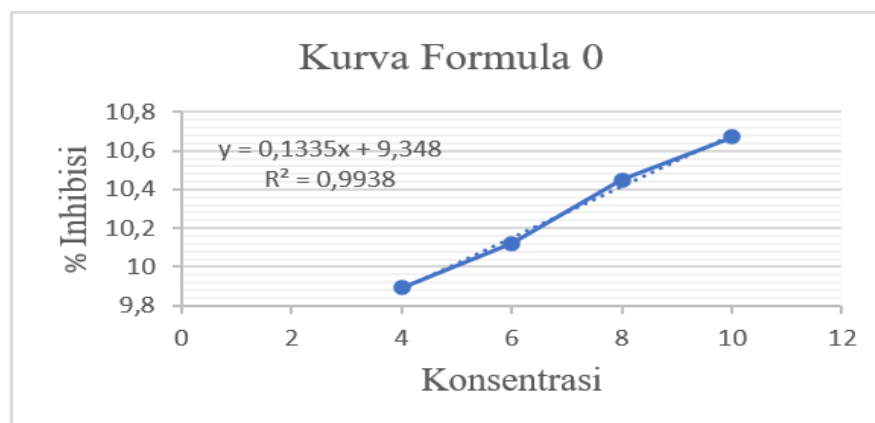
Lampiran 9. Kurva Aktivitas Antioksidan Sediaan Lip Balm

1. Kurva Aktivitas Antioksidan Formula 0 (Basis)

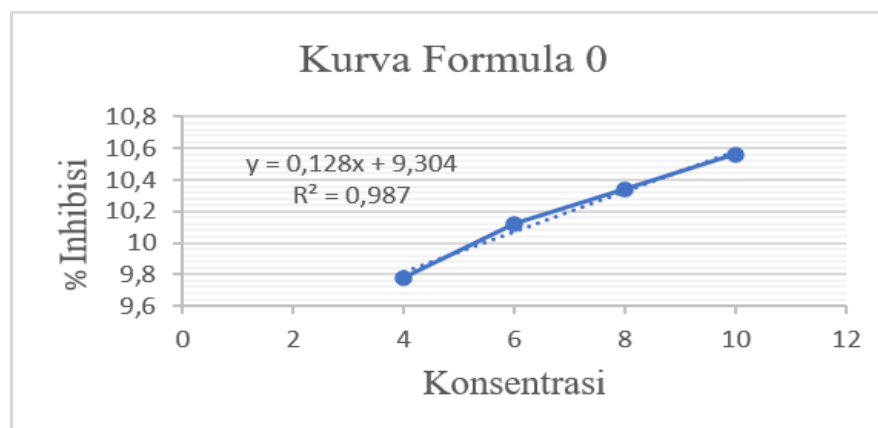
a. Replikasi 1



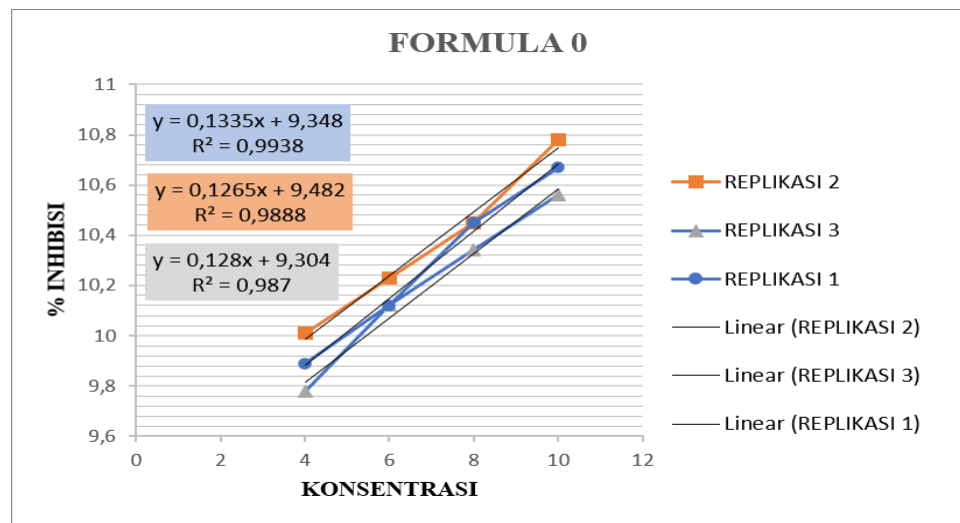
b. Replikasi 2



c. Replikasi 3

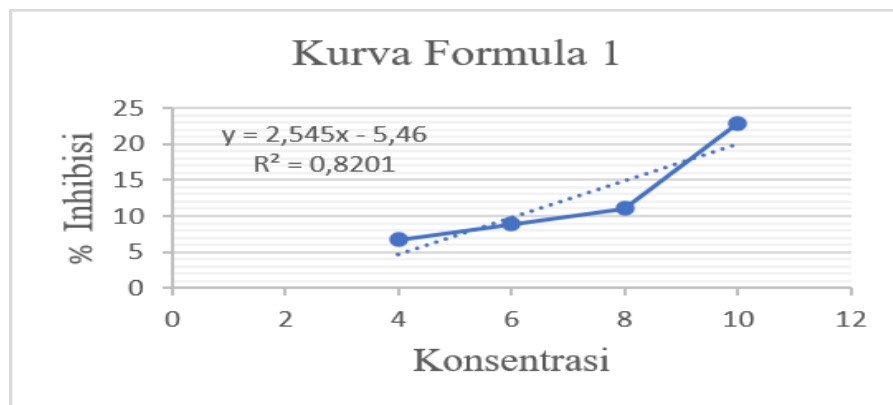


d. Seluruh Replikasi

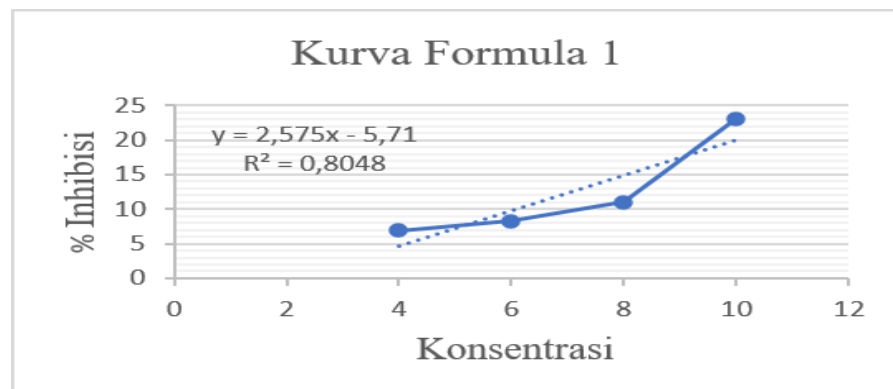


2. Kurva Aktivitas Antioksidan Formula 1

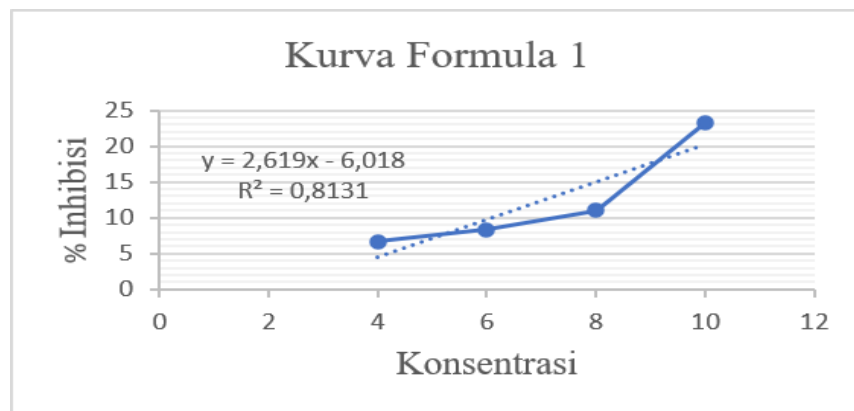
a. Replikasi 1



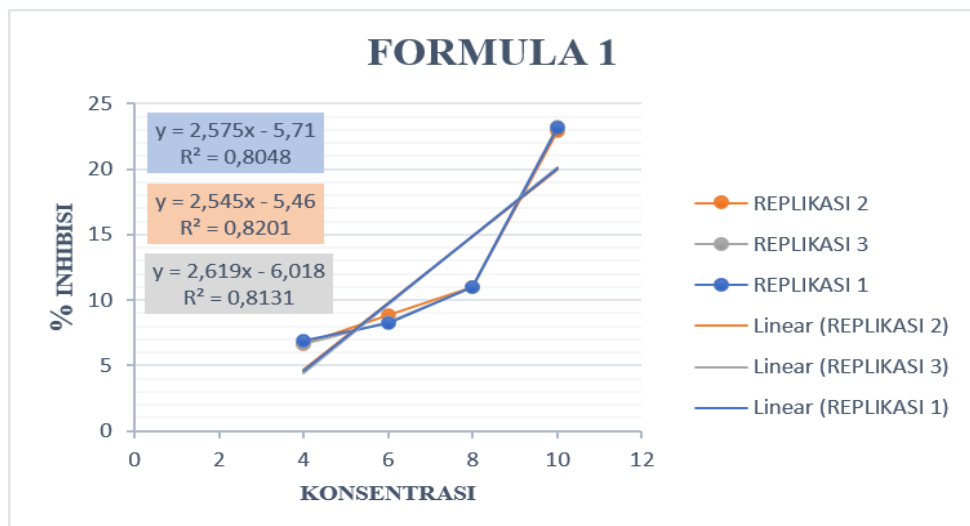
b. Replikasi 2



c. Replikasi 3

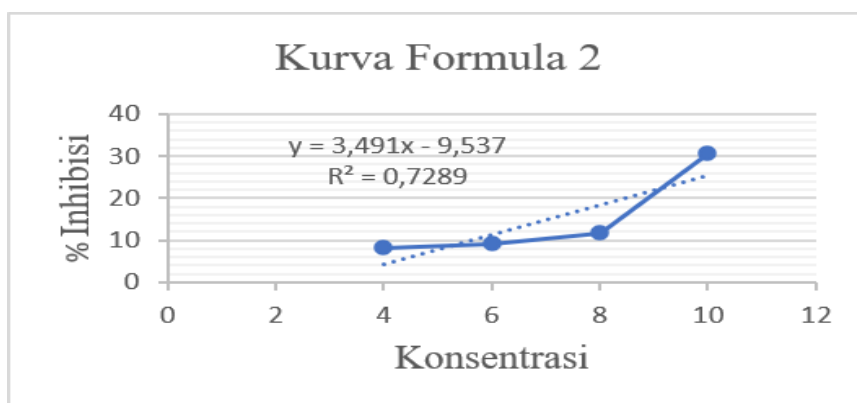


d. Seluruh Replikasi

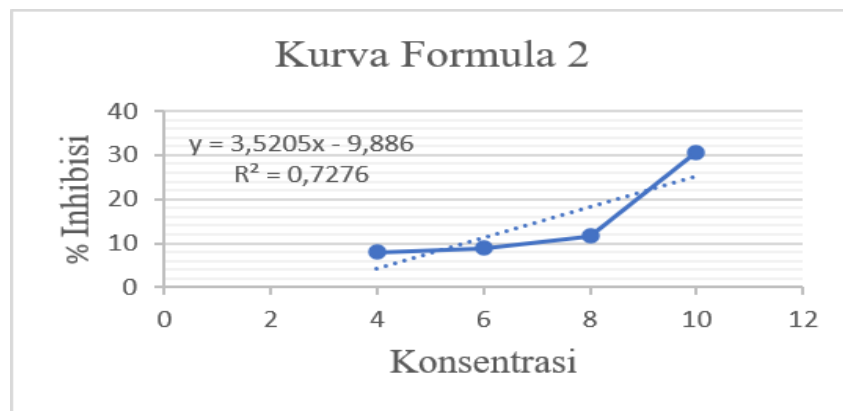


3. Kurva Aktivitas Antioksidan Formula 2

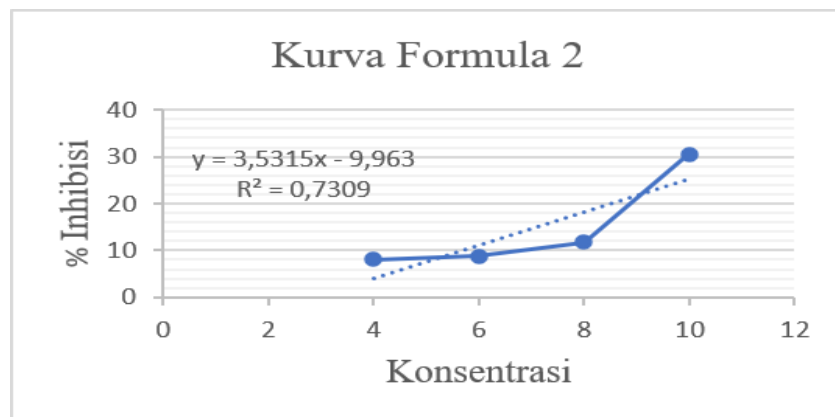
a. Replikasi 1



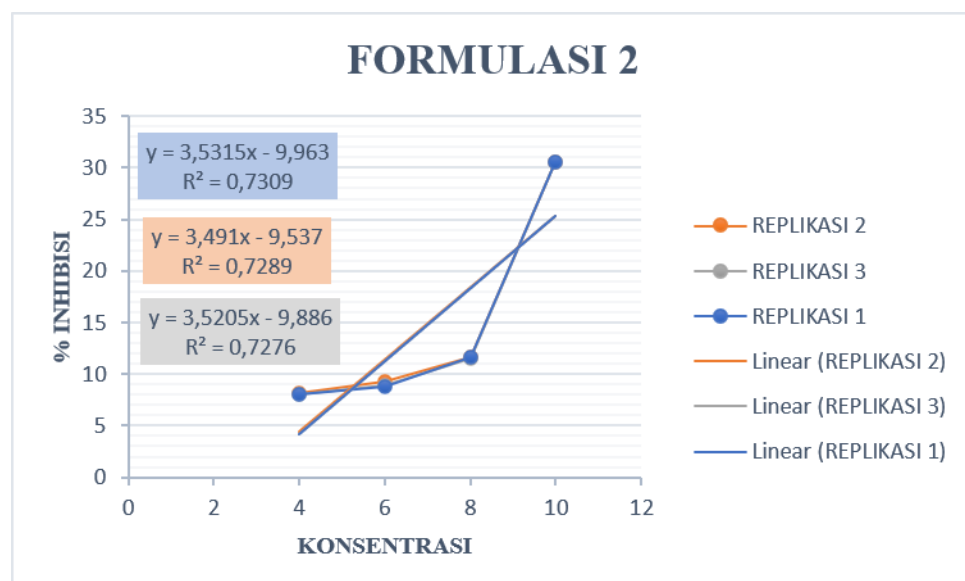
b. Replikasi 2



c. Replikasi 3

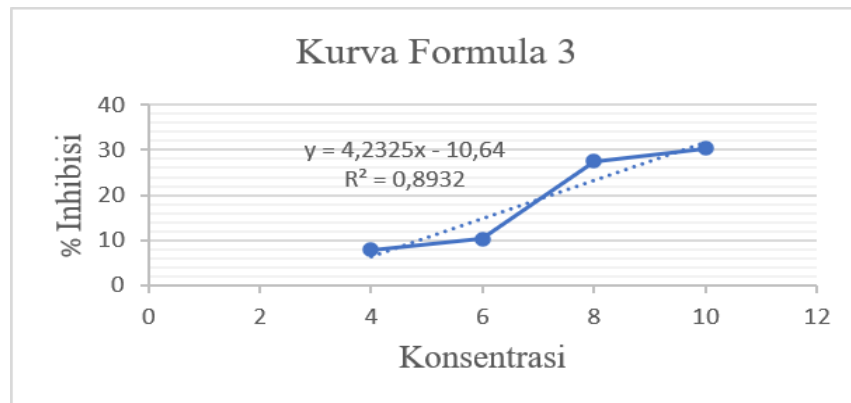


d. Seluruh Replikasi

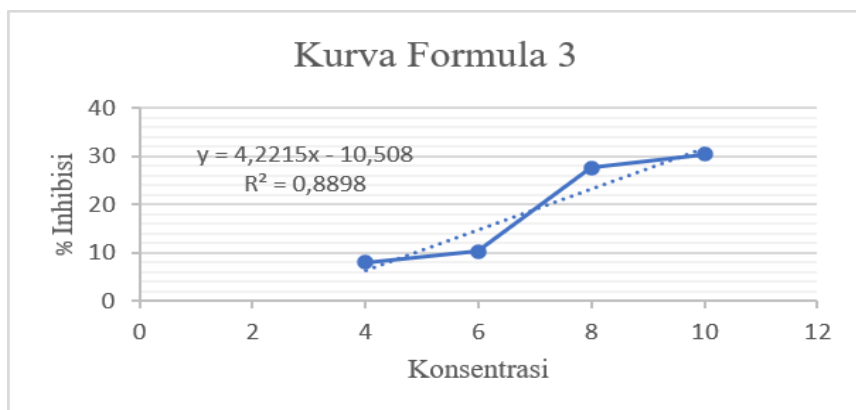


4. Kurva Aktivitas Antioksidan Formula 3

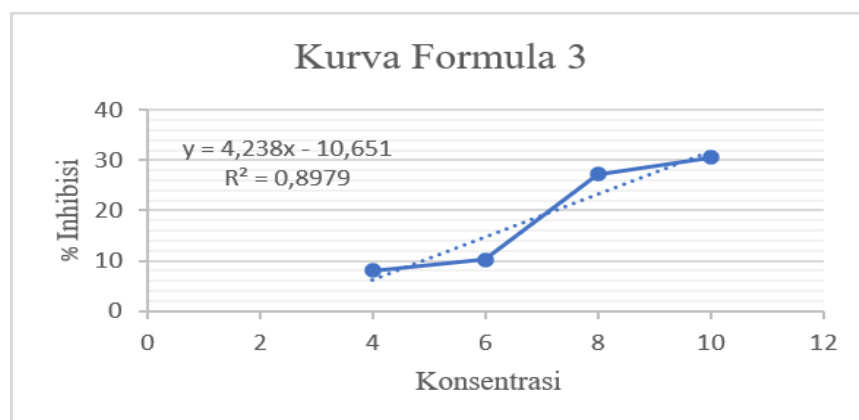
a. Replikasi 1



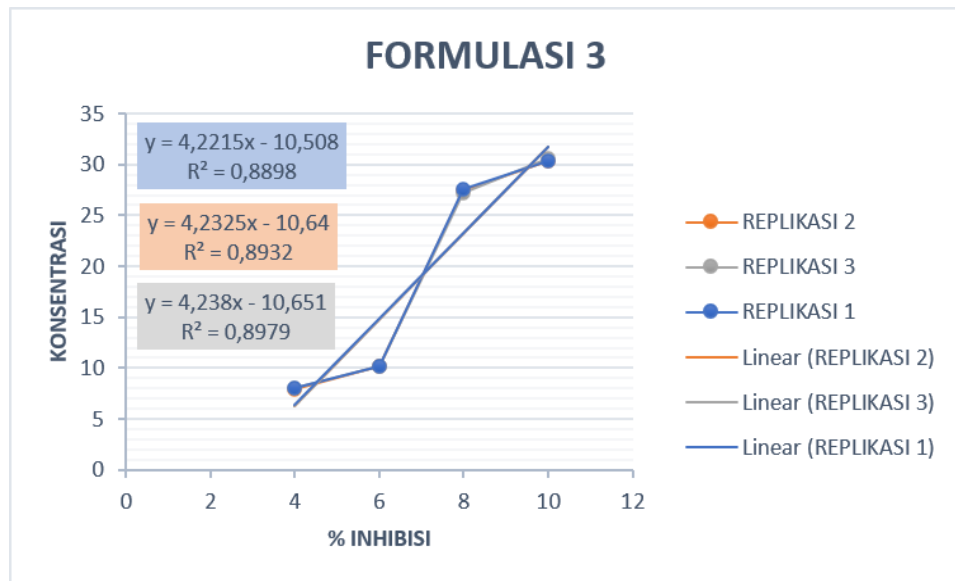
b. Replikasi 2



c. Replikasi 3

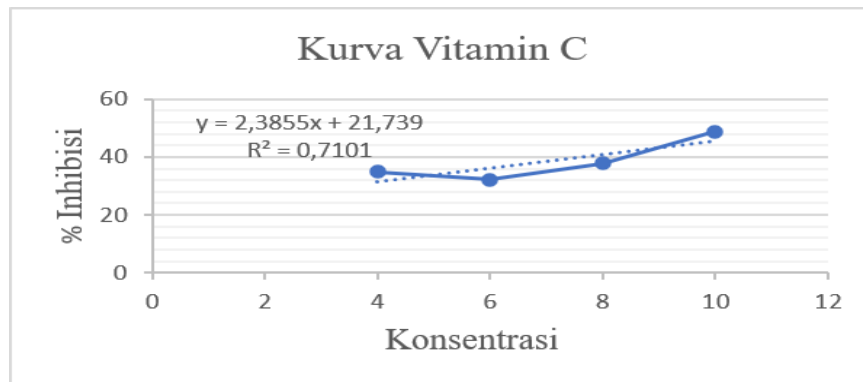


d. Seluruh Replikasi

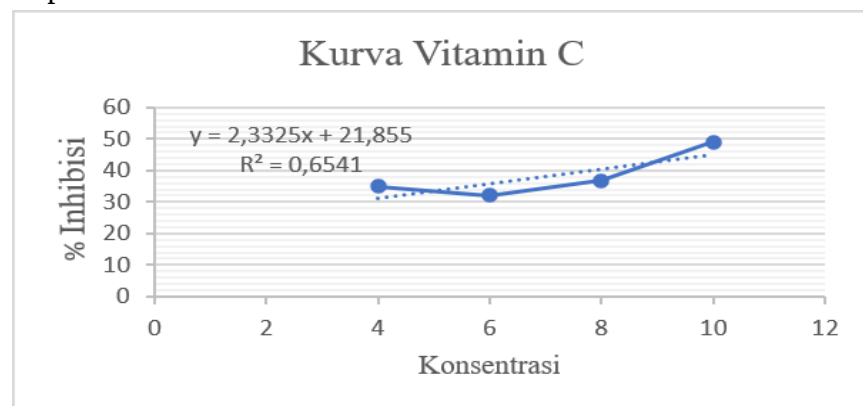


5. Kurva Aktivitas Antioksidan Vitamin C

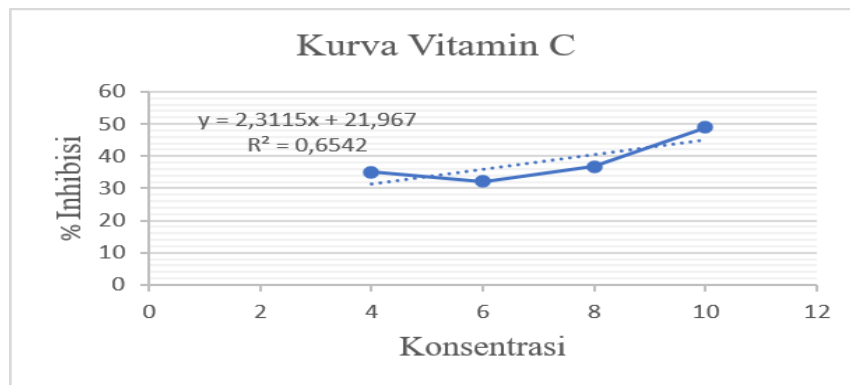
a. Replikasi 1



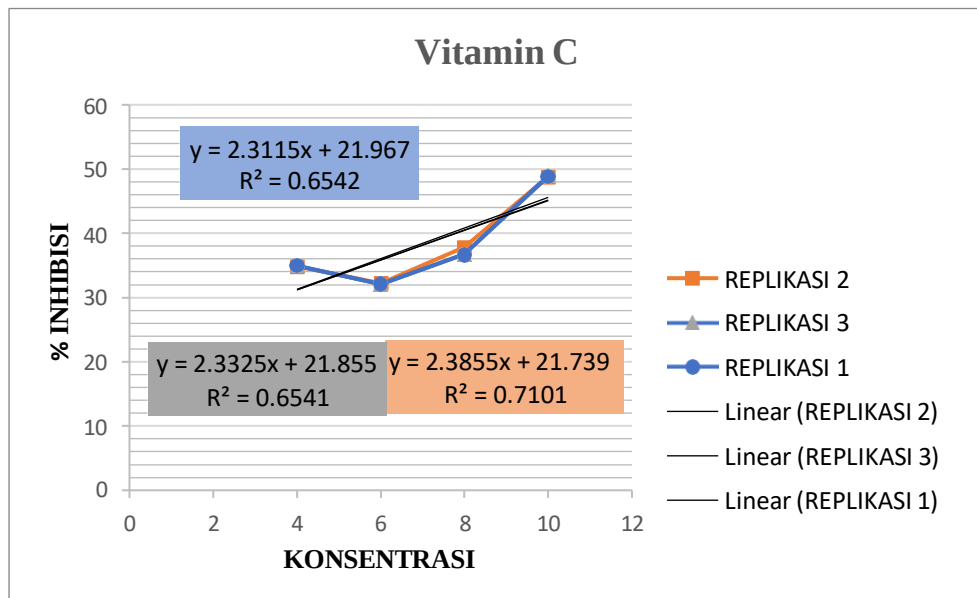
b. Replikasi 2



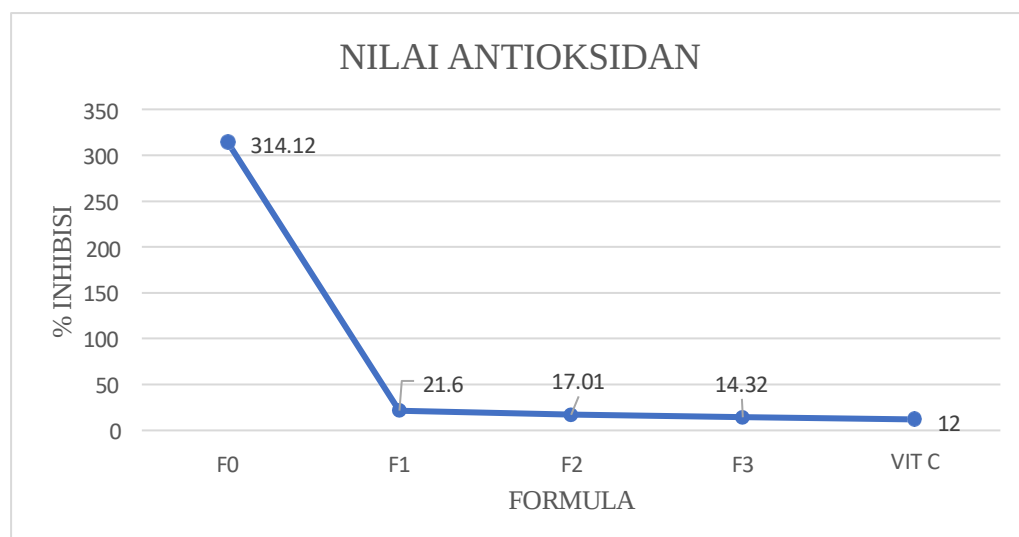
c. Replikasi 3



d. Seluruh Replikasi



6. Kurva Aktivitas Antioksidan Seluruh Formula (F0, F1, F2, F3, Vitamin C)



Lampiran 10. Hasil Uji One-Way Anova

1. Uji Normalitas (Shapiro-Wilk test)

Tests of Normality							
Formula		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
IC50	F1	.224	3	.	.984	3	.759
	F2	.175	3	.	1.000	3	1.000
	F3	.175	3	.	1.000	3	1.000
	Vit C	.308	3	.	.902	3	.391
a. Lilliefors Significance Correction							

2. Uji Homogenitas (Levene's Test)

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
IC50	Based on Mean	3.778	3	8	.059
	Based on Median	1.464	3	8	.296
	Based on Median and with adjusted df	1.464	3	4.108	.348
	Based on trimmed mean	3.585	3	8	.066

3. Uji Anova (One-Way Anova)

a. One Way Anova

ANOVA

IC50

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1527896.250	3	509298.750	3080.436	.000
Within Groups	1322.667	8	165.333		
Total	1529218.917	11			

b. Post Hoc Test

Multiple Comparisons

Dependent Variable: IC50

Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
F1	F2	459.000*	10.499	.000	425.38	492.62
	F3	728.000*	10.499	.000	694.38	761.62
	Vit C	959.333*	10.499	.000	925.71	992.95
F2	F1	-459.000*	10.499	.000	-492.62	-425.38
	F3	269.000*	10.499	.000	235.38	302.62
	Vit C	500.333*	10.499	.000	466.71	533.95
F3	F1	-728.000*	10.499	.000	-761.62	-694.38
	F2	-269.000*	10.499	.000	-302.62	-235.38
	Vit C	231.333*	10.499	.000	197.71	264.95
Vit C	F1	-959.333*	10.499	.000	-992.95	-925.71
	F2	-500.333*	10.499	.000	-533.95	-466.71
	F3	-231.333*	10.499	.000	-264.95	-197.71

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

c. Homogeneous Subsets

IC50

			Subset for alpha = 0.05			
	Formula	N	1	2	3	4
Tukey HSD ^a	Vit C	3	1200.67			
	F3	3		1432.00		
	F2	3			1701.00	
	F1	3				2160.00
	Sig.		1.000	1.000	1.000	1.000
Duncan ^a	Vit C	3	1200.67			
	F3	3		1432.00		
	F2	3			1701.00	
	F1	3				2160.00
	Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

Lampiran 11. COA Rosemary

**PT. TAROMANESIA**

The Real Essential Oil Fresh From Distillation

Jl. Karanggen Muda Kec Gunung Putri, Kabupaten Bogor, Provinsi Jawa Barat

Certificate of Analysis Sheet

ROSEMARY OIL (10321)

Analysis Specifications

PARAMETER	SPECIFICATION	RESULT
Appearance	Clear, mobile liquid	Conform to standard
Color	Colorless to light yellow	Conform to standard
Odor	Characteristic of rosemary, cineol note	Conform to standard
Specific Gravity (20°C)	0.895 - 0.920	0.918
Refractive Index (20 °C)	1.460 - 1.475	1.464
Optical Rotation	(-3°) - (+5°)	+4.52°
Alpha pinene Content (GC)	5-20%	19.80%
1.8-Cineol Content (GC)	Min 30%	51.57%
Camphor Content (GC)	5-20%	19.97%
Solubility	Soluble in alcohol and oils. Not soluble in water	Conform to standard
Fatty oil	Negative	Negative
D E P	Not detected	Not detected
D O P	Not detected	Not detected

Note:

This report pertains only to the sample taken by the lot. This is indicative and may be vary according to the raw material and climate variation.

Issued by : Quality Control

This computer generated Certificate of Analysis is valid without signature

**This Data Document is obtained From Supplier and rewritten by Tetesan Atsiri*

Lampiran 12. Izin 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: 616/KEP/III.3.AU/F/2025

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 scrutinized and completed ethical reviews on the research plan proposal, hereby certifies that:

Title : Formulasi Dan Uji Aktivitas Antioksidan Bedaan Lip Balm Minyak Atsiri Daun Rosemary (*Rosmarinus Officinalis* L) Dengan Menggunakan Metode Dpph (1,1-Difenil-2 Pikril Hidrazil)

Peneliti : 1. Aninda Utami / kordinator peneliti
 2. Apt. Ervianingsih, S.Farm., M.Si
 3. Apt. Andi Sri Hardiyanti, S.Farm., M.Farm

Researcher : 1. Aninda Utami / Research coordinator
 2. Apt. Ervianingsih, S.Farm., M.Si
 3. Apt. Andi Sri Hardiyanti, S.Farm., M.Farm

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

Palopo, October 24th 2023
Chairman
 Mengesahui
 Ka.L.PPM

Jusrida, S.E., M.Ah., Ph.D
 NIDN. 0910067705

Lampiran 13. Surat Izin Meneliti

 MAJELIS PENDIDIKAN TINGGI, PENELITIAN DAN PENGEMBANGAN
UNIVERSITAS MUHAMMADIYAH PALOPO
LEMBAGA PENELITIAN DAN PENGABDIAN KEPADA MASYARAKAT (LPPM)
Lt. 2 Gedung MCC Universitas Muhammadiyah Palopo
Jl. Jend. Sudirman Km. 03 Binturu, Kota Palopo (91959) – Telp/Fax: (0471) 327429

Nomor : 729/III.3.AU/LPPM/F/2025 Palopo, 08 Desember 2025
Lampiran : -
Perihal : Permohonan Izin Penelitian

Kepada Yth
Kepala Laboratorium UM Palopo
Di _____
Tempat _____

Assalamu'alaikum warahmatullahi wabarakatuh

Dengan hormat, disampaikan bahwa dalam rangka pelaksanaan penelitian Mahasiswa Universitas Muhammadiyah Palopo, mohon kiranya diberikan izin untuk melakukan kegiatan penelitian kepada:

Nama : Aninda Utami
NIM : 221320005
Jurusan : SI Farmasi
Alamat : BTN Nyiur Permai Libukang 1 Blok A/12
Jenis Kelamin : Perempuan
No.Hp/Wa : 081917280282

Untuk melengkapi data penelitian yang berkaitan dengan Judul "**Formulasi Dan Uji Aktivitas Antioksidan Sediaan Lip Balm Minyak Atsiri Daun Rosemary (*Rosmarinus Officinalis* L.) Dengan Menggunakan Metode DPPH (1,1-Difenil-2 Pikrilhidrazil)**" penelitian akan dilakukan pada Desember 2025

Demikian permohonan dari kami, atas kerjasama yang baik diucapkan terima kasih.

Wassalamu'alaikum warahmatullahi wabarakatuh


Junaidi, SE, Ak, M, Ak, CA, Ph.D
NIDN: 0910067705

Tembusan:
- Dekan Bersangkutan
- Peringgal

SURAT IZIN PENELITIAN

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

Nama : Aninda Utami
NIM : 221320005
Dapat melaksanakan penelitian di Laboratorium Tekno dan Kimia Fakultas Farmasi Universitas Muhammadiyah Palopo.

Palopo, 8 Desember 2025

Apt. Andi Sri Hardiyanti, S.Farm., M.Farm.
NUPM: 4049774675230303

Lampiran 14. Surat Keterangan Selesai Meneliti



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: 009KET/III.3.AU/LAB-FARM/F/2024

Yang bertanda tangan dibawah ini :

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

Jabatan : Ketua Program Studi Farmasi

Menerangkan dengan sesungguhnya bahwa :

Nama : Aninda Utami

Nim : 221320005

Judul : Formulasi dan Uji Aktivitas Antioksidan Sediaan Lip Balm
Minyak Atsiri Daun Rosemary (Rosmariunus Officinalis L.)
Dengan Menggunakan Metode DPPH (2,2-Diphenyl-1-Pircylhydrazyl)

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, 03 juni 2026

Ketua Program Studi Farmasi



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

BIODATA PENULIS

A. Data Pribadi

1. Nama Lengkap : Aninda Utami
2. Tempat Tanggal Lahir : Palopo, 12 Juli 2024
3. Jenis Kelamin : Perempuan
4. Alamat : BTN.Nyiur Permai Libukang 1
5. Pekerjaan : Pelajar (Mahasiswa)
6. E-mail : utamianinda12@gmail.com
7. Kontak Pribadi : 081917280282

B. Riwayat Pendidikan

1. TK Negri Pembina Palopo (2009-2010)
2. SDN 12 Langkanae Palopo (2010-2016)
3. SMP Datuk Sulaiman Palopo (2016-2019)
4. SMA Datuk Sulaiman Palopo (2019-2022)
5. Universitas Muhammadiyah Palopo (2022-2026)

C. Pengalaman Organisasi

1. Anggota Internal Himpunan Mahasiswa Farmasi

Palopo, 10 Juni 2026

Aninda Utami