

LAMPIRAN

Lampiran 1. Perhitungan Rendeman

1. Rendemen ekstrak kulit buang manggis

$$\text{Rendemen} = \frac{\text{Berat ekstrak kental}}{\text{Berat sampel}} \times 100\%$$

$$\text{Rendemen} = \frac{160,55 \text{ g}}{371,98 \text{ g}} \times 100\%$$

$$\text{Rendemen} = 43,16\%$$

2. Maserasi

$$\text{Berat serbuk} = 371,98 \text{ g}$$

$$\text{Etanol} = 2,603 \text{ mL}$$

Lampiran 2. Perhitungan Formula

Formula I

No	Formula	Konsentrasi	Perhitungan Penimbangan
1.	Ekstrak Kulit Manggis	2,5	$\frac{2,5}{100} \times 100 \text{ gram} = 2,5 \text{ gram}$
2.	Gelatin	13	$\frac{13}{100} \times 100 \text{ gram} = 13 \text{ gram}$
3.	Asam sitrat	0,2	$\frac{0,2}{100} \times 100 \text{ gram} = 0,2 \text{ gram}$
4.	Fruktosa syrup	40	$\frac{40}{100} \times 100 \text{ gram} = 40 \text{ gram}$
5.	Essens anggur	0,3	$\frac{0,3}{100} \times 100 \text{ gram} = 0,3 \text{ gram}$
6.	Aquadest	ad 100 mL	Ad 100 mL

Formula II

No	Formula	Konsentrasi	Perhitungan Penimbangan
1.	Ekstrak Kulit Manggis	5	$\frac{5}{100} \times 100 \text{ gram} = 5 \text{ gram}$
2.	Gelatin	13	$\frac{13}{100} \times 100 \text{ gram} = 13 \text{ gram}$
3.	Asam sitrat	0,2	$\frac{0,2}{100} \times 100 \text{ gram} = 0,2 \text{ gram}$
4.	Fruktosa syrup	40	$\frac{40}{100} \times 100 \text{ gram} = 40 \text{ gram}$
5.	Essens anggur	0,3	$\frac{0,3}{100} \times 100 \text{ gram} = 0,3 \text{ gram}$
6.	Aquadest	ad 100 mL	ad 100 mL

Formulasi III

No	Formula	Konsentrasi	Perhitungan Penimbangan
1.	Ekstrak kulit manggis	7,5	$\frac{7,5}{100} \times 100 \text{ gram} = 7,5 \text{ gram}$
2.	Gelatin	13	$\frac{13}{100} \times 100 \text{ gram} = 13 \text{ gram}$
3.	Asam sitrat	0,2	$\frac{0,2}{100} \times 100 \text{ gram} = 0,2 \text{ gram}$
3.	Fruktosa syrup	40	$\frac{40}{100} \times 100 \text{ gram} = 40 \text{ gram}$
4.	Essens anggur	0,3	$\frac{0,3}{100} \times 100 \text{ gram} = 0,3 \text{ gram}$
5.	Aquadest	ad 100 mL	ad 100 ml

Lampiran 3. Perhitungan Uji Kadar Air

Formula I

Berat A (Cawan kosong)

$$RI = 36,915$$

$$RII = 34,562$$

$$RIII = 33,590$$

Berat B (Cawan + sampel sebelum oven)

$$RI = 41,895$$

$$RII = 39,526$$

$$RIII = 38,546$$

Berat C (Cawan + sampel setelah di oven)

$$RI = 40,875$$

$$RII = 38,009$$

$$RIII = 37,125$$

$$\text{Perhitungan} = \frac{(B-A)(C-A)}{(B-A)} \times 100\%$$

$$RI = \frac{(41,895-36,915)-(40,875-36,915)}{(41,895-36,915)} \times 100\%$$

$$= \frac{(4,98-3,96)}{(4,98)} \times 100\%$$

$$= \frac{(1,02)}{(4,98)} \times 100\%$$

$$= 20\%$$

$$RII = \frac{(39,526-34,526)-(38,009-34,526)}{(39,526-34,526)} \times 100\%$$

$$= \frac{(4,964-3,447)}{(4,964)} \times 100\%$$

$$= \frac{(1,517)}{(4,964)} \times 100\%$$

$$= 30\%$$

$$\begin{aligned}
 R_{III} &= \frac{(38,546-33,590)-(37,125-33,590)}{(38,546-33,590)} \times 100\% \\
 &= \frac{(4,956-3,535)}{(4,956)} \times 100\% \\
 &= \frac{(1,421)}{(4,956)} \times 100\% \\
 &= 28 \%
 \end{aligned}$$

Formula II

Berat A (Cawan kosong)

$$R_I = 38,484$$

$$R_{II} = 34,375$$

$$R_{III} = 36,087$$

Berat B (Cawan + sampel sebelum oven)

$$R_I = 43,423$$

$$R_{II} = 39,316$$

$$R_{III} = 41,036$$

Berat C (Cawan + sampel setelah di oven)

$$R_I = 42,547$$

$$R_{II} = 38,264$$

$$R_{III} = 40,060$$

$$\text{Perhitungan} = \frac{(B-A)(C-A)}{(B-A)} \times 100\%$$

$$R_I = \frac{(43,423-38,484)-(42,547-38,484)}{(43,423-38,484)} \times 100\%$$

$$= \frac{4,939-4,063}{4,939} \times 100\%$$

$$= \frac{(0,876)}{(4,939)} \times 100\%$$

$$= 17\%$$

$$R_{II} = \frac{(39,316-34,375)-(38,264-34,375)}{(39,316-34,375)} \times 100\%$$

$$= \frac{(4,941-3,889)}{(4,941)} \times 100\%$$

$$= \frac{(1,052)}{(4,941)} \times 100\%$$

$$= 21\%$$

$$RIII = \frac{(41,036-36,087)-(40,060-36,087)}{(36,087-41,036)} \times 100\%$$

$$= \frac{(4,949-3,973)}{(4,949)} \times 100\%$$

$$= \frac{(0,976)}{(4,949)} \times 100\%$$

$$= 19\%$$

Formula III

Berat A (Cawan kosong)

$$RI = 37,452$$

$$RII = 37,300$$

$$RIII = 37,452$$

Berat B (Cawan + sampel sebelum oven)

$$RI = 42,395$$

$$RII = 42,216$$

$$RIII = 42,395$$

Berat C (Cawan + sampel setelah di oven)

$$RI = 41,319$$

$$RII = 41,216$$

$$RIII = 41,815$$

$$\text{Perhitungan} = \frac{(B-A)(C-A)}{(B-A)} \times 100\%$$

$$\text{RI} = \frac{(42,395-37,452)-(41,319-37,452)}{(42,395-37,452)} \times 100\%$$

$$= \frac{(4,943-3,867)}{(4,943)} \times 100\%$$

$$= \frac{(1,076)}{(4,943)} \times 100\%$$

$$= 21\%$$

$$\text{RII} = \frac{(42,216-37,300)-(41,261-37,300)}{(42,216-37,300)} \times 100\%$$

$$= \frac{(4,916-3,961)}{(4,916)} \times 100\%$$

$$= \frac{(0,955)}{(4,916)} \times 100\%$$

$$= 19\%$$

$$\text{RIII} = \frac{(42,395-37,452)-(41,815-37,452)}{(42,395-37,452)} \times 100\%$$

$$= \frac{(4,943-4,363)}{(4,943)} \times 100\%$$

$$= \frac{(0,58)}{(4,943)} \times 100\%$$

$$= 11\%$$

Lampiran 4. Perhitungan Kadar Abu

Formula I

Berat A (Cawan kosong)

$$RI = 36,915$$

$$RII = 34,562$$

$$RIII = 33,590$$

Berat B (Cawan + sampel sebelum oven)

$$RI = 41,895$$

$$RII = 39,526$$

$$RIII = 38,546$$

Berat C (Cawan + sampel setelah di oven)

$$RI = 37,004$$

$$RII = 34,661$$

$$RIII = 33,682$$

$$\text{Perhitungan} = \frac{(C-A)}{(B-A)} \times 100\%$$

$$RI = \frac{(37,004-36,915)}{(41,895-36,915)} \times 100\%$$

$$= \frac{0,089}{4,98} \times 100\%$$

$$= 0,0178 \times 100\%$$

$$= 1,78\%$$

$$RII = \frac{(34,661-34,562)}{(39,526-34,562)} \times 100\%$$

$$= \frac{(0,099)}{(4,964)} \times 100\%$$

$$= 0,0199 \times 100\%$$

$$= 1,99\%$$

$$RIII = \frac{(33,682-33,590)}{(38,546-33,590)} \times 100\%$$

$$= \frac{(0,092)}{(4,956)} \times 100\%$$

$$= 0,0185 \times 100\%$$

$$= 1,85\%$$

Formula II

Berat A (Cawan kosong)

$$RI = 38,484$$

$$RII = 34,375$$

$$RIII = 36,087$$

Berat B (Cawan + sampel sebelum oven)

$$RI = 43,523$$

$$RII = 39,316$$

$$RIII = 41,036$$

Berat C (Cawan + sampel setelah di oven)

$$RI = 38,583$$

$$RII = 34,471$$

$$RIII = 36,185$$

$$\text{Perhitungan} = \frac{(C-A)}{(B-A)} \times 100\%$$

$$RI = \frac{(38,583-38,484)}{(43,423-38,484)} \times 100\%$$

$$= \frac{(0,099)}{(4,939)} \times 100\%$$

$$= 0,0200 \times 100\%$$

$$= 2,00\%$$

$$RII = \frac{(34,471-34,375)}{(39,316-34,375)} \times 100\%$$

$$= \frac{(0,096)}{(4,941)} \times 100\%$$

$$= 0,0194 \times 100\%$$

$$= 1,94\%$$

$$\begin{aligned}
 R_{III} &= \frac{(36,185-36,087)}{(41,036-36,087)} \times 100\% \\
 &= \frac{(0,098)}{(4,949)} \times 100\% \\
 &= 0,0198 \times 100\% \\
 &= 1,98\%
 \end{aligned}$$

Formula III

Berat A (Cawan kosong)

$$R_I = 37,452$$

$$R_{II} = 37,300$$

$$R_{III} = 37,452$$

Berat B (Cawan + sampel sebelum oven)

$$R_I = 42,395$$

$$R_{II} = 42,216$$

$$R_{III} = 42,395$$

Berat C (Cawan + sampel setelah di oven)

$$R_I = 38,187$$

$$R_{II} = 37,398$$

$$R_{III} = 37,551$$

$$\text{Perhitungan} = \frac{(C-A)}{(B-A)} \times 100\%$$

$$R_I = \frac{(37,545-37,542)}{(42,395-37,452)} \times 100\%$$

$$= \frac{(0,093)}{(4,943)} \times 100\%$$

$$= 0,0188 \times 100\%$$

$$= 1,88\%$$

$$R_{II} = \frac{(37,398-37,300)}{(42,216-37,300)} \times 100\%$$

$$= \frac{(0,098)}{(4,916)} \times 100\%$$

$$= 0,0199 \times 100\%$$

$$= 1,99\%$$

$$\text{RIII} = \frac{(37,551-37,452)}{(42,395-37,452)} \times 100\%$$

$$= \frac{(0,099)}{(4,943)} \times 100\%$$

$$= 0,0200 \times 100\%$$

$$= 2,00\%$$

Lampiran 5. Perhitungan Pembuatan Larutan DPPH

1. Perhitungan pembuatan larutan DPPH 1000 ppm

$$\text{DPPH 1000 ppm} = 1000 \mu\text{g/mL} = 1 \text{ mg/mL}$$

$$10 \text{ mg} = \frac{10.000 \mu\text{g/mL}}{10 \text{ mL}}$$

$$10 \text{ mg}/10 \text{ mL} = 1000 \mu\text{g/mL}$$

$$= 1000 \text{ ppm}$$

$$\text{DPPH yang dibutuhkan} = 1 \text{ mg/mL} \times 10 \text{ mL} = 10 \text{ mg}$$

Methanol ad 10 mL

2. Pembuatan blanko DPPH 40 ppm

DPPH 40 ppm

N1 = DPPH 1000 ppm

V2 = Volume yang dibuat 100 mL

N2 = Konsentrasi yang dibuat 40 ppm

$$V1 \times N1 = V2 \times N2$$

$$V1 \times 1000 \text{ ppm} = 100 \text{ mL} \times 40 \text{ ppm}$$

$$V1 = \frac{4000}{1000}$$

$$V1 = 4 \text{ mL ditambahkan methanol ad 100 mL}$$

Lampiran 6. Perhitungan Pembuatan Larutan Seri Ekstrak Kulit Manggis

Larutan induk 1000 ppm $\longrightarrow$ 10 mg/10 mL $\longrightarrow$ 1000 μ g/mL

Dibuat konsentrasi larutan seri 100 ppm, 150 ppm, 200 ppm, 250 ppm, dan 300 ppm.

1. Konsentrasi 100 ppm

$$V_1 \times N_1 = V_2 \times N_2$$

$$V_1 \times 1000 = 10 \times 100$$

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

$$= 1 \text{ ml/10 ml}$$

2. Konsentrasi 150 ppm

$$V_1 \times N_1 = V_2 \times N_2$$

$$V_1 \times 1000 = 10 \times 150$$

$$V_1 = \frac{1500}{1000}$$

$$= 1,5 \text{ ml/10 ml}$$

3. Konsentrasi 200 ppm

$$V_1 \times N_1 = V_2 \times N_2$$

$$V_1 \times 1000 = 10 \times 200$$

$$V_1 = \frac{2000}{1000}$$

$$= 2 \text{ ml}/10 \text{ ml}$$

4. Konsentrasi 250

$$V1 \times N1 = V2 \times N2$$

$$V1 \times 1000 = 10 \times 250$$

$$V1 = \frac{2500}{1000}$$

$$= 2,5 \text{ ml}/10 \text{ ml}$$

5. Konsentrasi 300 ppm

$$V1 \times N1 = V2 \times N2$$

$$V1 \times 1000 = 10 \times 300$$

$$V1 = \frac{3000}{1000}$$

$$= 3 \text{ ml}/10 \text{ ml}$$

Lampiran 7. Pembuatan Larutan Vitamin C

Larutan Induk vitamin C 1000 ppm $\longrightarrow$ 10 mg/10 mL $\longrightarrow$ 1000 μ g/mL

Dibuat konsentrasi larutan seri 10 ppm, 20 ppm, 40 ppm, dan 60 ppm.

1. Konsentrasi 10 ppm

$$V_1 \times N_1 = V_2 \times N_2$$

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

$$V_1 = \frac{100}{1000}$$

$$= 0,1 \text{ ml/10 ml}$$

2. Konsentrasi 20 ppm

$$V_1 \times N_1 = V_2 \times N_2$$

$$V_1 \times 1000 = 10 \times 20$$

$$V_1 = \frac{200}{1000}$$

$$= 0,2 \text{ ml/10 ml}$$

3. Konsentrasi 40 ppm

$$V_1 \times N_1 = V_2 \times N_2$$

$$V_1 \times 1000 = 10 \times 40$$

$$V_1 = \frac{400}{1000}$$

$$= 0,4 \text{ ml/10 ml}$$

4. Konsentrasi 60 ppm

$$V1 \times N1 = V2 \times N2$$

$$V1 \times 1000 = 10 \times 60$$

$$V1 = \frac{600}{1000}$$

$$= 0,6 \text{ ml/10 ml}$$

5. Konsentrasi 80 ppm

$$V1 \times N1 = V2 \times N2$$

$$V1 \times 1000 = 10 \times 80$$

$$V1 = \frac{800}{1000}$$

$$= 0,8 \text{ ml/10 ml}$$

Lampiran 8. Perhitungan % Inhibisi Uji Aktivitas Antioksidan

Nilai Absorbansi			
FI	FII	FII	Vitamin C
0,046	0,052	0,068	0,001
0,070	0,073	0,077	0,039
0,087	0,088	0,088	0,71
0,108	0,109	0,104	0,088
0,147	0,109	0,104	0,092

$$\% \text{ Inhibisi} = \frac{\text{Absorbansi kontrol} - \text{Absorbansi larutan uji}}{\text{Absorbansi kontrol}} \times 100\%$$

Formula I

$$300 = \frac{0,404 - 0,046}{0,404} \times 100\% = 88,41\%$$

$$250 = \frac{0,404 - 0,070}{0,404} \times 100\% = 82,67\%$$

$$200 = \frac{0,404 - 0,087}{0,404} \times 100\% = 78,46\%$$

$$150 = \frac{0,404 - 0,108}{0,404} \times 100\% = 74,39\%$$

$$100 = \frac{0,404 - 0,147}{0,404} \times 100\% = 65,27\%$$

Formula II

$$300 = \frac{0,404 - 0,052}{0,404} \times 100\% = 87,03\%$$

$$250 = \frac{0,404 - 0,073}{0,404} \times 100\% = 81,99\%$$

$$200 = \frac{0,404 - 0,088}{0,404} \times 100\% = 78,19\%$$

$$150 = \frac{0,404 - 0,0109}{0,404} \times 100\% = 72,91\%$$

$$100 = \frac{0,404 - 0,125}{0,404} \times 100\% = 69,11\%$$

Formula III

$$300 = \frac{0,404 - 0,068}{0,404} \times 100\% = 83,15\%$$

$$250 = \frac{0,404 - 0,077}{0,404} \times 100\% = 80,84\%$$

$$200 = \frac{0,404 - 0,088}{0,404} \times 100\% = 78,03\%$$

$$150 = \frac{0,404 - 0,104}{0,404} \times 100\% = 74,15\%$$

$$100 = \frac{0,404 - 0,137}{0,404} \times 100\% = 66,06\%$$

Vitamin C

$$80 = \frac{0,404 - 0,001}{0,404} \times 100\% = 99,66\%$$

$$60 = \frac{0,404 - 0,039}{0,404} \times 100\% = 90,17\%$$

$$40 = \frac{0,404 - 0,071}{0,404} \times 100\% = 82,24\%$$

$$20 = \frac{0,404 - 0,088}{0,404} \times 100\% = 78,03\%$$

$$10 = \frac{0,404 - 0,092}{0,404} \times 100\% = 77,04\%$$

Lampiran 9. Perhitungan Nilai IC₅₀ Uji Aktivitas Antioksidan

Sampel	% Inhibisi	Log Konsentrasi	Probit	Persamaan Regresi Linear	Nilai IC ₅₀ (µg/ml)
Formula I	89,00	1,829	6,23	$y = 0,7979x + 3,3849$	105,72%
	83,34	1,783	5,95		
	79,41	1,760	5,81		
	74,39	1,730	5,64		
	65,27	1,685	5,39		
Formula II	87,03	1,821	6,13	$y = 0,6371x + 4,8645$	60,57%
	81,99	1,813	5,92		
	78,19	1,802	5,77		
	72,91	1,790	5,61		
	69,11	1,783	5,50		
Formula III	83,15	1,783	5,95	$y = 5,6667x - 4,1596$	41,33%
	80,84	1,765	5,84		
	78,03	1,753	5,77		
	74,15	1,730	5,64		
	66,06	1,688	5,41		
Vitamin C	99,66	1,992	7,33	$y = 1,4904x + 4,6127$	8,52%
	90,17	1,837	6,28		
	82,24	1,778	5,92		
	78,03	1,753	5,77		
	77,04	1,735	5,67		

Perhitungan nilai IC₅₀ = $y = ax + b$

Formula I

$$y = 0,7979x + 3,3849$$

$$5 = 0,7979x + 3,3849$$

$$x = \frac{5 - 3,3849}{0,7979}$$

$$x = 105,72 \text{ µg/ml}$$

Formula II

$$y = 0,6371x + 4,8645$$

$$5 = 0,6371x + 4,8645$$

$$x = \frac{5-4,8645}{0,6371}$$

$$x = 60,57 \text{ } \mu\text{g/ml}$$

Formula III

$$y = 5,6667x - 4,1596$$

$$5 = 5,6667x - 4,1596$$

$$x = \frac{5+4,1596}{5,6667}$$

$$x = 41,33 \text{ } \mu\text{g/ml}$$

Vitamin C

$$y = 1,4904x + 4,6127$$

$$5 = 1,4904x + 4,6127$$

$$x = \frac{5-4,6127}{1,4904}$$

$$x = 8,52 \text{ } \mu\text{g/ml}$$

Lampiran 10. Pembuatan simplisia kulit manggis

No	Gambar	Keterangan
1.		Pengeringan
2.		Dihaluskan

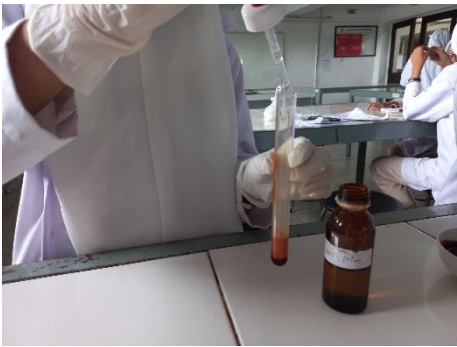
Lampiran 11. Pembuatan ekstrak

No	Gambar	Keterangan
1.		Penyaringan
2.		Penguapan menggunakan evaporator

3.		Ekstrak yang mengental
4.		Ekstrak yang akan digunakan

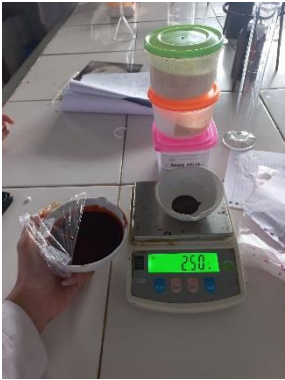
Lampiran 12. Uji Flavonoid

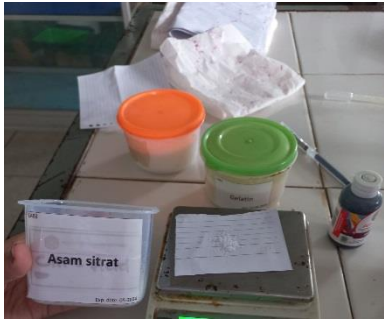
No	Gambar	Keterangan
1.		Memasukkan 2 ml ekstrak
2.		Menambahkan 2ml etanol 95%
3.		Etanol 95%

4.		HCL 2N
5.		Menambahkan 2ml HCL 2N
6.		Menambahkan 2ml HCL pekat

7.	 A gloved hand is holding two test tubes. The test tube on the left contains a dark red liquid, while the test tube on the right contains a lighter orange-red liquid. They are held against a wooden test tube rack.	Hasil
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Lampiran 13. Bahan-bahan pembuatan permen jelly

No	Gambar	Keterangan
		Ekstrak 2,5%
		Ekstrak 5%
		Ekstrak 7,5%

		Fruktosa
		Asam sitrat
		Gelatin

Lampiran 14. Pembuatan permen *jelly*

No	Gambar	Keterangan
1.		Fruktosa syrup di panaskan
2.		Aquadest panas
3.		Gelatin dilarutkan dalam aquades panas

4.		Penambahan essens
5.		Penambahan kedua bahan (gelatin+essens) ke dalam fruktosa panas
6.		Penambahan ekstrak

7.		Oles minyak
8.		Pencetakan

Lampiran 15. Uji sifat fisik permen *jelly*

No	Gambar	Keterangan
1.		Uji pH
2.		Uji kadar air
3.		Uji kadar abu



POLITEKNIK HARAPAN BERSAMA
The True Vocational Campus

D-3 Farmasi

No : 087.06/FAR.PHB/VII/2025
Hal : Keterangan Praktek Laboratorium

SURAT KETERANGAN

Dengan ini menerangkan bahwa mahasiswa berikut :

Nama : Ririn Nurrani
NIM : 22080055
Judul Tugas Akhir : Formulasi Dan Uji Aktivitas Antioksidan Permen Jelly Kering Dari Ekstrak
Etanol Kulit Manggis (Garcinia mangostana L) Menggunakan Metode DPPH

Benar – benar telah melakukan penelitian di Laboratorium Diploma III Farmasi Politeknik Harapan
Bersama Tegal.

Demikian surat keterangan ini untuk digunakan sebagaimana mestinya.

Tegal, 14 Juli 2025
Ka. Program Studi Diploma III Farmasi
Politeknik Harapan Bersama



apt. Rizki Febriyanti, M.Farm.
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CURICULUM VITAE



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Diploma III	: Diploma III Farmasi Politeknik Harapan Bersama Tegal
Nama Ayah	: Suyamto
Nama Ibu	: Nina H
Judul TA	: Formulasi Dan Uji Aktivitas Antioksidan Permen <i>Jelly Kering</i> Dari Ekstrak Etanol Kulit Buah Manggis (<i>Garcinia mangostana</i> L) menggunakan metode DPPH.