

LAMPIRAN

Lampiran 1. Kode Etik Penelitian Untuk Uji Hedonik

KOMITE ETIK PENELITIAN KESEHATAN
HEALTH RESEARCH ETHICS COMMITTEE
SEKOLAH TINGGI ILMU KESEHATAN BAKTI TUNAS HUSADA TASIKMALAYA
STIKES BTH

KETERANGAN LAYAK ETIK
DESCRIPTION OF ETHICAL EXEMPTION
"ETHICAL EXEMPTION"

No.118/kepk-bth/V/2021

Protokol penelitian yang diusulkan oleh :
The research protocol proposed by

Peneliti utama : Ilham Taufik
Principal In Investigator
Nama Institusi : STIKes Bakti Tunas Husada Tasikmalaya
Name of the Institution
Dengan judul :
Title

**"Formulasi dan Evaluasi Aktivitas Antioksidan Metode DPPH
pada Sediaan Spray Gel β -Karoten"**

Dinyatakan layak etik sesuai 7 (tujuh) Standar WHO 2011, yaitu 1) Nilai Sosial, 2) Nilai Ilmiah, 3) Pemerataan Beban dan Manfaat, 4) Risiko, 5) Bujukan/Eksploitasi, 6) Kerahasiaan dan Privacy, dan 7) Persetujuan Setelah Penjelasan, yang merujuk pada Pedoman CIOMS 2016. Hal ini seperti yang ditunjukkan oleh terpenuhinya indikator setiap standar.
Declared to be ethically appropriate in accordance to 7 (seven) WHO 2011 Standards, 1) Social Values, 2) Scientific Values, 3) Equitable Assessment and Benefits, 4) Risks, 5) Persuasion/Exploitation, 6) Confidentiality and Privacy, and 7) Informed Consent, referring to the 2016 CIOMS Guidelines. This is as indicated by the fulfillment of the indicators of each standard.

Pernyataan Laik Etik ini berlaku selama kurun waktu tanggal 31 Mei 2021 sampai dengan tanggal 31 Mei 2022.
This declaration of ethics applies during the period Mei 31, 2021 until Mei 31, 2022.

31 Mei, 2021
Chairperson,


Ilham Alifian, Farm., Apt

Lampiran 2. Certificate of Analysis β -karoten

SIGMA-ALDRICH[®]

sigma-aldrich.com

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:

β -Carotene - synthetic, $\geq 93\%$ (UV), powder

Product Number: C9750
Batch Number: MKCK2908
Brand: SIGMA
CAS Number: 7235-40-7
MDL Number: MFCD00001556
Formula: C40H56
Formula Weight: 536.87 g/mol
Storage Temperature: Store at 2 - 8 °C
Quality Release Date: 03 JUL 2019



Test	Specification	Result
Appearance (Color)	Red to Very Dark Red-Brown	Very Dark Red
Appearance (Form)	Powder	Powder
Solubility (Color)	Dark Red to Dark Red-Brown	Dark Red-Brown
Solubility (Turbidity)	Clear	Clear
1 mg + 1 mL, CHCl ₃		
Purity	92.5 - 101.0 %	95.5 %
by UVVS		
(Based on E1% = 2280 for Lambda Maximum of 478 nm to 479 nm in Hexane)		
Purity	92.5 - 101.0 %	95.6 %
by UVVS		
(Based on E1% = 2590 for Lambda Maximum of 450 nm to 451 nm in Hexane)		

Michael Grady, Manager
Quality Control
Milwaukee, WI US

Sigma-Aldrich warrants, that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current Specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Version Number: 2

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Lampiran 3. Safety Data Sheet

Sigma-Aldrich

www.sigmaaldrich.com

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 6.4
Revision Date 30.04.2021
Print Date 23.06.2021

GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : β -Carotene

Product Number : C9750

Brand : Sigma

REACH No. : A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

CAS-No. : 7235-40-7

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Pte Ltd
(Co. Registration No. 199403788W)
1 Science Park Road
#02-14 The Capricorn, S'pore Sci. PkII
SINGAPORE 117528
SINGAPORE

Telephone : +65 6779-1200

Fax : +65 6779-1822

1.4 Emergency telephone

Emergency Phone # : 1-800-262-8200

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.

2.2 Label elements

Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.







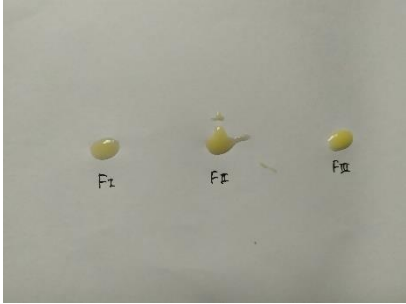
Sigma- C9750

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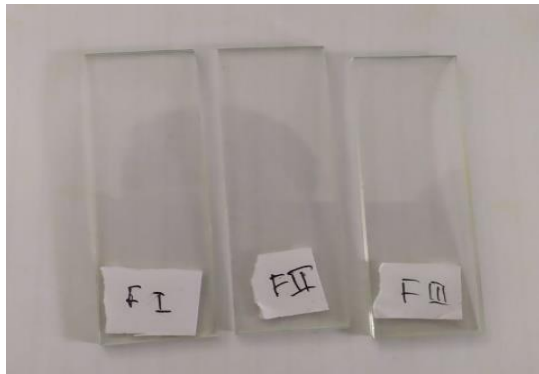
The life science business of Merck operates as MilliporeSigma in the US and Canada



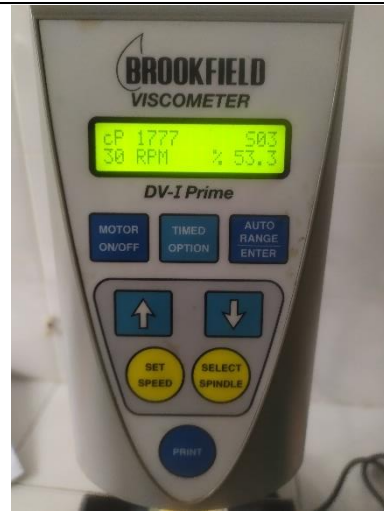
Lampiran 4. Dokumentasi

	
<p>β-karoten</p>	<p>Larutan β-karoten</p>
	
<p>Pemanasan Aquadest</p>	<p>Pembuatan <i>Gelling Agent</i></p>
	
<p>Sediaan Jadi</p>	<p>Sediaan dalam botol semprot</p>
	
<p>Tampilan setelah di semprotkan</p>	

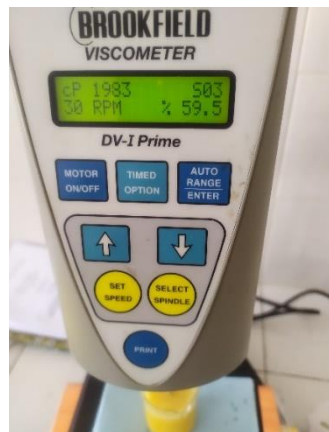
Lampiran 5. Pengujian



Uji Homogenitas



Uji Viskositas Formula 1



Uji Viskositas Formula 2





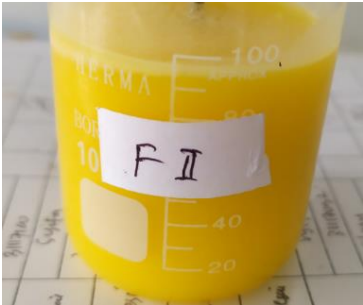

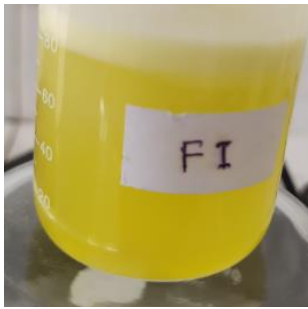

Uji Viskositas Formula 3



Uji pH Formula 1

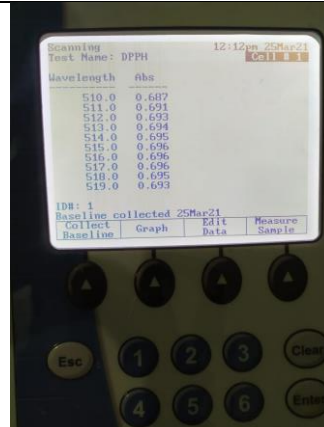


Uji pH Formula 2

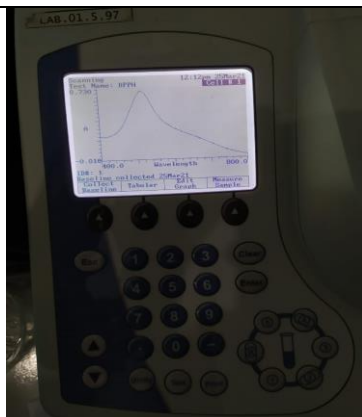
	
<p>Uji pH Formula 3</p>	<p>Uji <i>Cycling Test</i> F1(Siklus 1)</p>
	
<p>Uji <i>Cycling Test</i> F2 (Siklus 1)</p>	<p>Uji <i>Cycling Test</i> F3 (Siklus 1)</p>
	
<p>Uji <i>Cycling Test</i> F1(Siklus 3)</p>	<p>Uji <i>Cycling Test</i> F2(Siklus 2)</p>



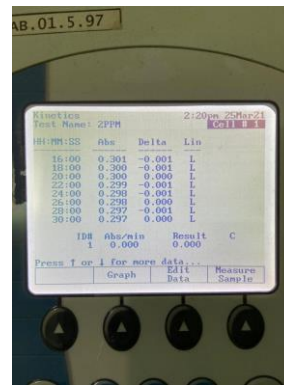
Uji Cycling Test F3 (Siklus 2)



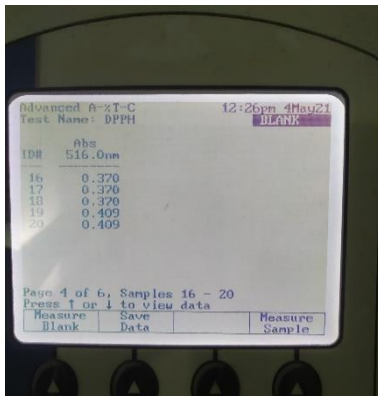
Uji Antioksidan Penentuan Panjang gelombang



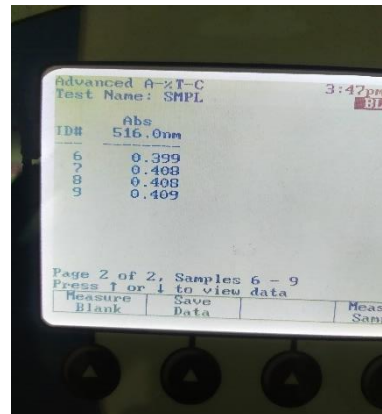
Uji Antioksidan Grafik Panjang gelombang



Uji Antioksidan Operating Time



Uji Antioksidan β -karoten



Uji Antioksidan Sediaan

Lampiran 6. Perhitungan

Perhitungan:

- **Perhitungan Pembuatan larutan induk DPPH 1000 ppm dalam 50 ml**

$$1000 \text{ ppm} \times 0,05 \text{ L} = 50 \text{ mg}$$

Jadi Dpph yang di timbang 50 mg dilarutkan dalam 50 ml metanol p.a

- **Pengenceran Larutan DPPH 30 ppm**

$$M_1 \times V_1 = M_2 \times V_2$$

$$1000 \text{ ppm} \times V_1 = 30 \text{ ppm} \times 100 \text{ ml}$$

$$V_1 = \frac{3000}{1000} = 3 \text{ ml}$$

Jadi larutkan 3 ml dari larutan induk kedalam 100 ml metanol p.a

- **Perhitungan Pembuatan larutan induk Vitamin C (asam askorbat)**

$$1000 \text{ ppm} \times 0,05 \text{ L} = 50 \text{ mg}$$

Jadi asam askorbat yang di timbang 50 mg dilarutkan dalam 50 ml metanol p.a

- **Pengenceran Larutan asam askorbat 10 ppm**

$$M_1 \times V_1 = M_2 \times V_2$$

$$1000 \text{ ppm} \times V_1 = 10 \text{ ppm} \times 50 \text{ ml}$$

$$V_1 = \frac{500}{1000} = 0,5 \text{ ml}$$

Jadi larutkan 0,5 ml dari larutan induk kedalam 50 ml metanol p.a

- **Pengenceran Larutan asam askorbat 1,5 ppm, 2 ppm, 2,5 ppm, 4 ppm dan 5 ppm**

- 1,5 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$10 \text{ ppm} \times V_1 = 1,5 \text{ ppm} \times 5 \text{ ml}$$

$$V_1 = \frac{7,5}{10} = 0,75 \text{ ml}$$

Jadi larutkan 0,75 ml dari larutan stok 10 ppm kedalam 5 ml metanol p.a

- 2 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$10 \text{ ppm} \times V_1 = 2 \text{ ppm} \times 5 \text{ ml}$$

$$V_1 = \frac{10}{10} = 1 \text{ ml}$$

Jadi larutkan 1 ml dari larutan stok 10 ppm kedalam 5 ml metanol p.a

- 2,5 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$10 \text{ ppm} \times V_1 = 2,5 \text{ ppm} \times 5 \text{ ml}$$

$$V_1 = \frac{12,5}{10} = 1,25 \text{ ml}$$

Jadi larutkan 1,25 ml dari larutan stok 10 ppm kedalam 5 ml metanol p.a

- 4 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$10 \text{ ppm} \times V_1 = 4 \text{ ppm} \times 5 \text{ ml}$$

$$V_1 = \frac{20}{10} = 2 \text{ ml}$$

Jadi larutkan 2 ml dari larutan stok 10 ppm kedalam 5 ml metanol p.a

- 5 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$10 \text{ ppm} \times V_1 = 5 \text{ ppm} \times 5 \text{ ml}$$

$$V_1 = \frac{25}{10} = 2,5 \text{ ml}$$

Jadi larutkan 2,25 ml dari larutan stok 10 ppm kedalam 5 ml metanol p.a

- **Perhitungan Pembuatan larutan induk β -karoten**

$$1000 \text{ ppm} \times 0,05 \text{ L} = 50 \text{ mg}$$

Jadi β -karoten yang di timbang 50 mg dilarutkan dalam 50 ml metanol p.a

- **Pengenceran Larutan asam askorbat 200 ppm**

$$M_1 \times V_1 = M_2 \times V_2$$

$$1000 \text{ ppm} \times V_1 = 200 \text{ ppm} \times 50 \text{ ml}$$

$$V_1 = \frac{10000}{1000} = 10 \text{ ml}$$

Jadi larutkan 10 ml dari larutan induk kedalam 50 ml metanol p.a

- **Pengenceran Larutan asam askorbat 8 ppm, 20 ppm, 40 ppm, 90 ppm dan 100 ppm**

- 8 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$200 \text{ ppm} \times V_1 = 8 \text{ ppm} \times 5 \text{ ml}$$

$$V_1 = \frac{40}{200} = 0,2 \text{ ml}$$

Jadi larutkan 0,2 ml dari larutan stok 200 ppm kedalam 5 ml metanol p.a

- 20 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$200 \text{ ppm} \times V_1 = 20 \text{ ppm} \times 5 \text{ ml}$$

$$V_1 = \frac{100}{200} = 0,5 \text{ ml}$$

Jadi larutkan 0,5 ml dari larutan stok 200 ppm kedalam 5 ml metanol p.a

- 40 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$200 \text{ ppm} \times V_1 = 40 \text{ ppm} \times 5 \text{ ml}$$

$$V_1 = \frac{200}{200} = 1 \text{ ml}$$

Jadi larutkan 1 ml dari larutan stok 200 ppm kedalam 5 ml metanol p.a

- 90 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$200 \text{ ppm} \times V_1 = 90 \text{ ppm} \times 5 \text{ ml}$$

$$V_1 = \frac{450}{200} = 2,25 \text{ ml}$$

Jadi larutkan 2,25 ml dari larutan stok 200 ppm kedalam 5 ml metanol p.a
- 100 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$200 \text{ ppm} \times V_1 = 100 \text{ ppm} \times 5 \text{ ml}$$

$$V_1 = \frac{500}{200} = 2,5 \text{ ml}$$

Jadi larutkan 2,5 ml dari larutan stok 200 ppm kedalam 5 ml metanol p.a

- **Pengenceran Sediaan**

$$1000 \text{ ppm} \times 0,05 \text{ L} = 50 \text{ mg}$$

Jadi Sediaan F1, F2, dan F3 yang di timbang 50 mg dilarutkan dalam 50 ml metanol p.a

- **Perhitungan % Inhibisi:**

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

- **% Inhibisi Asam askorbat**

- 1,5 ppm: $\text{Inhibisi (\%)} = \frac{(0,834 - 0,447) \times 100\%}{0,834} = 46,38\%$
- 2 ppm: $\text{Inhibisi (\%)} = \frac{(0,834 - 0,417) \times 100\%}{0,834} = 49,98\%$
- 2,5 ppm: $\text{Inhibisi (\%)} = \frac{(0,834 - 0,404667) \times 100\%}{0,834} = 51,46\%$
- 4 ppm: $\text{Inhibisi (\%)} = \frac{(0,834 - 0,367) \times 100\%}{0,834} = 55,98\%$
- 5 ppm: $\text{Inhibisi (\%)} = \frac{(0,834 - 0,326333) \times 100\%}{0,834} = 60,86\%$

- **% Inhibisi β -karoten**

- 8 ppm: $\text{Inhibisi (\%)} = \frac{(0,709 - 0,409) \times 100\%}{0,709} = 42,29\%$
- 20 ppm: $\text{Inhibisi (\%)} = \frac{(0,709 - 0,397) \times 100\%}{0,709} = 43,98\%$
- 40 ppm: $\text{Inhibisi (\%)} = \frac{(0,709 - 0,372333) \times 100\%}{0,709} = 47,46\%$
- 90 ppm: $\text{Inhibisi (\%)} = \frac{(0,709 - 0,333667) \times 100\%}{0,709} = 52,92\%$
- 100 ppm: $\text{Inhibisi (\%)} = \frac{(0,709 - 0,320) \times 100\%}{0,709} = 54,84\%$

- **% Inhibisi Sediaan Spray gel β -karoten**

- Formula 1: Inhibisi (%) = $\frac{(0,709 - 0,4083333) \times 100\%}{0,709} = 42,3800564\%$

- Formula 2: Inhibisi (%) = $\frac{(0,709 - 0,3996667) \times 100\%}{0,709} = 43,6030103\%$

- Formula 3: Inhibisi (%) = $\frac{(0,709 - 0,3773333) \times 100\%}{0,709} = 46,7544685\%$

Perhitungan Nilai IC₅₀:

- **Nilai IC₅₀ Asam askorbat**

$$y = ax + b$$

$$50 \% = 0,0381x + 0,4149$$

$$x = \frac{(0,5 - 0,4149)}{0,0381} = 2,231 \mu\text{g/mL} = 2,231 \text{ ppm}$$

- **Nilai IC₅₀ β -karoten**

$$y = ax + b$$

$$50 \% = 0,0013x + 0,415$$

$$x = \frac{(0,5 - 0,415)}{0,0013} = 64,526 \mu\text{g/mL} = 64,526 \text{ ppm}$$

Lampiran 7. Tabel Data

Tabel 4.1 Hasil Pemeriksaan Organoleptik

Formula	Bentuk	Warna	Aroma	Homogenitas
F1	Kental	Kuning Keruh	Khas Vanilla	Homogen
F2	Kental	Kuning Keruh	Khas Vanilla	Homogen
F3	Kental	Kuning Keruh	Khas Vanilla	Homogen

Keterangan: F1 = Formula 1

F2 = Formula 2

F3 = Formula 3

Tabel 4.2 Hasil Uji Viskositas dengan spindle No. 3 dengan 30 rpm

Formulasi	Viskositas (cPs)
Formula 1	1777
Formula 2	1983
Formula 3	1383

Tabel 4.3 Hasil analisis aktivitas antioksidan As.Askorbat

Kadar	Abs	% Inhibisi	slope	IC ₅₀ (ppm)	Kontrol Negatif (DPPH)	
1,5	0,447	46,38%	0,0381	2,231	Rep 1	0,834
2	0,417	49,98%			Rep 2	0,834
2,5	0,404667	51,46%	Intercept		Rep 3	0,833
4	0,367	55,98%	0,4149		Rata-rata	0,834
5	0,326333	60,86%	Correlation (r²)			
			0,9817			

Tabel 4.4 Hasil analisis antioksidan β -karoten

Kadar	Abs	% Inhibisi	slope	IC ₅₀ (ppm)	Kontrol Negatif (DPPH)	
8	0,409	42,29%	0,0013	64,526	Rep 1	0,709
20	0,397	43,98%			Rep 2	0,708
40	0,372333	47,46%	Intercept		Rep 3	0,709
90	0,333667	52,92%	0,4150		Rata-rata	0,709
100	0,32	54,84%	Correlation (r²)			
			0,9934			

Tabel 4.5 Hasil analisis antioksidan pada Sediaan

Sampel	Absorbansi	Rata-rata	% Inhibisi
DPPH	0,709	0,7086667	
	0,708		
	0,709		
F3	0,377	0,3773333	46,7544685 %
	0,378		
	0,377		
F2	0,4	0,3996667	43,6030103 %
	0,4		
	0,399		
F1	0,408	0,4083333	42,3800564 %
	0,408		
	0,409		

Tabel 4.6 Hasil Uji Hedonik

Parameter	Formula	Skala Numerik			
		1	2	3	4
Warna	F1	0	5	11	14
	F2	1	10	19	0
	F3	3	18	5	4
Aroma	F1	0	3	20	7
	F2	1	3	23	3
	F3	1	7	16	6
Sensasi dikulit (Kelengketan)	F1	0	5	12	13
	F2	1	7	17	5
	F3	4	15	5	6

Tabel 4.7 Hasil Output SPSS Uji Hedonik

Parameter Uji		F1	F2	F3
Warna	Mean	3,300	2,600	2,333
	SD	0,7497	0,5632	0,8442
	Asymp.Sig	0,000		

Parameter Uji		F1	F2	F3
Aroma	Mean	3,133	2,933	2,900
	SD	0,7513	0,5833	0,7589
	Asymp.Sig	0,081		

Parameter Uji		F1	F2	F3
Sensasi dikulit (Kelengketan)	Mean	3,267	2,867	2,433
	SD	0,7397	0,7303	0,9714
	Asymp.Sig	0,003		

Tabel Hasil Uji Hedonik

Panelis	warna			Total	aroma			Total	kelengketan			Total
	F1	F2	F3		F1	F2	F3		F1	F2	F3	
1	4	3	2	9	3	3	1	7	2	4	2	8
2	4	3	2	9	4	3	2	9	4	3	2	9
3	3	2	4	9	2	2	4	8	3	2	4	9
4	2	3	2	7	3	3	3	9	4	2	2	8
5	3	1	4	8	4	1	4	9	3	1	4	8
6	3	2	1	6	3	3	3	9	3	3	2	8
7	3	2	2	7	3	3	3	9	4	3	3	10
8	2	2	1	5	3	3	3	9	4	3	2	9
9	3	3	2	8	3	3	3	9	3	2	2	7
10	2	2	3	7	3	3	2	8	3	2	1	6
11	3	3	3	9	4	4	4	12	4	4	4	12
12	3	3	2	8	3	3	3	9	2	3	3	8
13	4	3	2	9	3	3	2	8	2	3	4	9
14	3	3	2	8	3	3	3	9	3	3	2	8
15	4	3	2	9	4	4	4	12	2	3	4	9
16	4	3	2	9	2	4	2	8	3	3	1	7
17	2	2	2	6	3	3	3	9	3	2	1	6
18	4	2	2	8	3	2	4	9	4	3	3	10
19	4	3	2	9	3	3	3	9	4	2	2	8
20	2	3	4	9	3	3	2	8	3	3	2	8
21	3	2	3	8	2	2	2	6	2	3	3	8
22	4	3	4	11	4	3	4	11	4	3	2	9
23	4	3	2	9	4	3	3	10	4	3	2	9
24	4	3	2	9	3	3	3	9	4	2	2	8
25	4	2	1	7	3	3	3	9	4	3	3	10
26	3	3	3	9	3	3	2	8	3	4	4	11
27	4	2	2	8	4	3	3	10	3	4	2	9
28	4	3	2	9	3	3	3	9	4	3	2	9
29	3	3	2	8	3	3	3	9	3	3	2	8
30	4	3	3	10	3	3	3	9	4	4	1	9

Lampiran 8. Hasil Analisis Statistik Uji *Friedman*

1. Warna

Ranks	
	Mean Rank
F1	2.55
F2	1.90
F3	1.55

Mean Rank menunjukkan respon paling tinggi pada setiap formula

Hipotesis :

Jika Asymp. sig < 0,05 = terdapat perbedaan warna pada ketiga formula

Jika Asymp. sig >0,05 = tidak terdapat perbedaan warna pada ketiga formula

Test Statistics ^a	
N	30
Chi-Square	19.516
df	2
Asymp. Sig.	.000

a. Friedman Test

Kesimpulan :

Asymp. Sig < 0,05. Artinya terdapat perbedaan warna pada ketiga formula

2. Aroma

Ranks	
	Mean Rank
F1	2.18
F2	1.97
F3	1.85

Mean Rank menunjukkan respon paling tinggi pada setiap formula

Hipotesis :

Jika Asymp. sig < 0,05 = terdapat perbedaan aroma pada ketiga formula

Jika Asymp. sig >0,05 = tidak terdapat perbedaan aroma pada ketiga formula

Test Statistics ^a	
N	30
Chi-Square	5.024
df	2
Asymp. Sig.	.081

a. Friedman Test

Kesimpulan :

Asymp. Sig > 0,05. Artinya tidak terdapat perbedaan aroma pada ketiga formula

3. Sensasi dikulit (Kelengketan)

Ranks

	Mean Rank
F1	2.38
F2	2.03
F3	1.58

Mean Rank menunjukkan respon paling tinggi pada setiap formula

Hipotesis :

Jika Asymp. sig < 0,05 = terdapat perbedaan rasa pada keempat formula

Jika Asymp. sig > 0,05 = tidak terdapat perbedaan rasa pada keempat formula

Test Statistics^a

N	30
Chi-Square	11.697
df	2
Asymp. Sig.	.003

a. Friedman Test

Kesimpulan :

Asymp. Sig < 0,05. Artinya terdapat perbedaan rasa pada keempat formula

Lampiran 9. Lembar Kuesioner

KUISIONER UJI TINGKAT KESUKAAN Spray GEL β -KAROTEN

Nama : Usia :

Jenis Kelamin : Tanggal :

Berilah tanda ceklis (√) pada setiap kolom sesuai pendapat anda.

A. Penilaian Spray GEL

Formula I				
Parameter	1	2	3	4
Warna				
Aroma				
Sensasi dikulit (Kelengketan)				
Formula II				
Parameter	1	2	3	4
Warna				
Aroma				
Sensasi dikulit (Kelengketan)				
Formula III				
Parameter	1	2	3	4
Warna				
Aroma				
Sensasi dikulit (Kelengketan)				

Keterangan :

1. Tidak Suka
2. Kurang Suka
3. Suka
4. Sangat Suka

Tasikmalaya,

Responden

()