BAB V
KESIMPULAN DAN SARAN

5.1 Kesimpulan

Pada penelitian tentang pengaruh kombinasi PVP K-30 dan Ac-Di-Sol terhadap mutu fisik tablet antipiretik ekstrak daun kemangi hutan (*Ocimum sanctum* L.) dihasilkan bahwa PVP K-30 dapat meningkatkan kekerasan tablet, meningkatkan waktu hancur tablet, dan menurunkan kerapuhan tablet, sedangkan Ac-Di-Sol dapat menurunkan kekerasan tablet, menurunkan waktu hancur tablet, dan meningkatkan kerapuhan tablet.

Penentuan formula optimum tablet antipiretik ekstrak daun kemangi hutn (*Ocimum sanctum* L.) dengan menggunakan *design-expert* dihasilkan formula optimum yaitu konsentrasi PVP K-30 sebesar 2,41% dan konsentrasi Ac-Di-Sol sebesar 2,79%.

5.2 Saran

Pada penelitian selanjutnya dapat dilakukan verifikasi formula optimum kombinasi PVP K-30 dan Ac-Di-Sol dengan konsentrasi PVP K-30 sebesar 2,41% dan konsentrasi Ac-Di-Sol sebesar 2,79% serta dilakukan uji disolusi untuk mengetahui profil pelepasan obat.

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LAMPIRAN A

HASIL STANDARISASI SIMPLISIA DAUN KEMANGI HUTAN

(*Ocimum sanctum* L.)

1. Susut Pengeringan

Replikasi	Susut pengeringan (%)
I	12,6
II	12,8
III	12,6
$\overline{X} \pm SD$	12,67 $\pm$ 0,1155

2. Kadar Air

Replikasi	Berat cawan (g)	Berat zat (g)	Berat cawan + zat konstan (g)	% Kadar
I	55,6513	10,0305	64,9857	6,94
II	58,4243	10,0711	67,8143	6,76
III	55,6378	10,0028	64,9508	6,89
$\overline{X} \pm SD$				6,86$\pm$0,09

$$\% \text{ Kadar} = \frac{\text{Berat zat} - ((\text{Berat cawan} + \text{zat konstan}) - \text{Berat cawan})}{\text{Berat zat}} x100\%$$

$$\% \text{ Kadar} = \frac{10,0305 - (64,9857 - 55,6513)}{10,0305} x100\% = 6,94\%$$

3. Kadar abu total

Replikasi	Berat krus (g)	Berat zat (g)	Berat cawan + abu konstan (g)	% Kadar
I	34,7496	2,0018	35,0241	13,71
II	34,7392	2,0032	35,0135	13,69
III	34,0790	2,0034	34,3545	13,75
$\overline{X} \pm SD$				13,72$\pm$0,03

$$\% \text{ Kadar} = \frac{(\text{Berat krus} + \text{abu konstan}) - \text{Berat krus}}{\text{Berat zat}} x100\%$$

$$\% \text{ Kadar} = \frac{35,0241 - 34,7496}{2,0018} x100\% = 13,71\%$$

4. Kadar abu tidak larut asam

Replikasi	Berat krus (g)	Berat zat (g)	Berat cawan + abu + HCl konstan (g)	% Kadar
I	34,7496	2,0018	34,8523	5,13
II	34,7392	2,0032	34,8422	5,14
III	34,0790	2,0034	34,1816	5,12
$\overline{X} \pm SD$				5,13±0,01

$$\% \text{ Kadar} = \frac{(\text{Berat krus} + \text{abu konstan}) - \text{Berat krus}}{\text{Berat zat}} \times 100\%$$

$$\% \text{ Kadar} = \frac{34,8523 - 34,7496}{2,0018} \times 100\% = 5,13\%$$

5. Kadar abu larut air

Replikasi	Berat krus (g)	Berat zat (g)	Berat abu (g)	Berat cawan + abu + aquadest konstan (g)	% Kadar
I	33,1244	2,0026	0,2786	33,3397	3,16
II	33,4085	2,0055	0,2781	33,6203	3,31
III	33,5217	2,9981	0,4542	33,8766	3,31
$\overline{X} \pm SD$					3,26±0,09

$$\% \text{ Kadar} = \frac{\text{Berat abu} - ((\text{Berat krus} + \text{abu konstan}) - \text{Berat krus})}{\text{Berat zat}} \times 100\%$$

$$\% \text{ Kadar} = \frac{0,2786 - (33,3397 - 33,1244)}{2,0026} \times 100\% = 3,16\%$$

6. Penentuan pH

Replikasi	pH
I	6,63
II	6,57
III	6,60
$\overline{X} \pm SD$	6,60 ± 0,03

7. Kadar senyawa larut air

Replikasi	Berat cawan (g)	Berat zat (g)	Berat cawan + senyawa konstan (g)	% Kadar
I	41,9724	5,0213	42,0854	11,25
II	44,6375	4,9764	44,7556	11,87
III	42,6078	4,9887	42,7259	11,84
$\overline{X} \pm SD$				11,65±0,35

$$\% \text{ Kadar} = \frac{(\text{Berat cawan} + \text{zat konstan}) - \text{Berat cawan}}{\text{Berat zat}} \times 100\%$$

$$\% \text{ Kadar} = \frac{42,0854 - 41,9724}{5,0213} \times 100\% = 11,25\%$$

8. Kadar senyawa larut etanol

Replikasi	Berat cawan (g)	Berat zat (g)	Berat cawan + senyawa konstan (g)	% Kadar
I	55,6503	4,9652	55,8643	21,55
II	58,4161	4,9875	58,6165	20,09
III	55,6292	4,9819	55,8134	18,49
$\overline{X} \pm SD$				20,04 ± 1,53

$$\% \text{ Kadar} = \frac{(\text{Berat cawan} + \text{zat konstan}) - \text{Berat cawan}}{\text{Berat zat}} \times 100\%$$

$$\% \text{ Kadar} = \frac{55,8643 - 55,6503}{4,9652} \times 100\% = 21,55\%$$

9. Rendemen hasil

Replikasi	Berat simplisia (g)	Berat ekstrak kental (g)	Rendemen (%)
I	1000	155,3	15,53
II	3000	466,8	15,56
III	3000	465,9	15,53
$\overline{X} \pm SD$			15,54 ± 0,02

LAMPIRAN B

HASIL STANDARISASI EKSTRAK DAUN KEMANGI HUTAN

(*Ocimum sanctum* L.)

1. Kadar Air

Replikasi	Berat cawan (g)	Berat zat (g)	Berat cawan + zat konstan (g)	% Kadar
I	40,0495	10,1723	48,0229	21,61
II	43,2625	10,1100	51,2147	21,34
III	42,3095	10,1209	50,2815	21,23
$\overline{X} \pm SD$				21,39±0,19

$$\% \text{ Kadar} = \frac{\text{Berat zat} - ((\text{Berat cawan} + \text{zat konstan}) - \text{Berat cawan})}{\text{Berat zat}} \times 100\%$$

$$\% \text{ Kadar} = \frac{10,1723 - (48,0229 - 40,0495)}{10,1723} \times 100\% = 21,61\%$$

2. Susut Pengeringan

Replikasi	Berat botol timbang (g)	Berat zat (g)	Berat botol timbang + zat konstan (g)	% Susut Pengeringan
I	13,9405	1,0565	14,9501	4,43
II	10,7701	1,0840	11,8109	3,98
III	24,7720	1,0803	25,7926	5,53
$\overline{X} \pm SD$				4,65±0,79

$$\% \text{Kadar} = \frac{\text{Berat zat} - ((\text{Berat botol timbang} + \text{zat konstan}) - \text{Berat botol timbang})}{\text{Berat zat}} \times 100\%$$

$$\% \text{ Kadar} = \frac{1,0565 - (14,9501 - 13,9405)}{1,0565} \times 100\% = 4,43\%$$

3. Kadar abu total

Replikasi	Berat krus (g)	Berat zat (g)	Berat cawan + abu konstan (g)	% Kadar
I	34,9147	2,0045	35,0347	5,84
II	31,8537	2,0070	31,9706	5,82
III	33,1004	2,0078	33,2208	5,99
$\overline{X} \pm SD$				5,88±0,09

$$\% \text{ Kadar} = \frac{(\text{Berat krus} + \text{abu konstan}) - \text{Berat krus}}{\text{Berat zat}} \text{x}100\%$$

$$\% \text{ Kadar} = \frac{35,0347 - 34,9147}{2,0045} \text{x}100\% = 5,84\%$$

4. Kadar abu tidak larut asam

Replikasi	Berat krus (g)	Berat zat (g)	Berat cawan + abu + HCl konstan (g)	% Kadar
I	31,6745	2,0074	31,7315	2,84
II	31,8537	2,0070	31,9225	2,96
III	33,1004	2,0078	33,1617	2,93
$\overline{X} \pm SD$				2,91±0,06

$$\% \text{ Kadar} = \frac{(\text{Berat krus} + \text{abu konstan}) - \text{Berat krus}}{\text{Berat zat}} \text{x}100\%$$

$$\% \text{ Kadar} = \frac{31,7315 - 31,6745}{2,0074} \text{x}100\% = 2,84\%$$

5. Kadar abu larut air

Replikasi	Berat krus (g)	Berat zat (g)	Berat abu (g)	Berat cawan + abu + aquadest konstan (g)	% Kadar
I	32,3239	2,0067	0,1102	32,3949	1,95
II	31,7012	2,0056	0,1200	31,7802	2,04
III	34,9147	2,0045	0,1200	34,9910	2,18
$\overline{X} \pm SD$					2,06±0,12

$$\% \text{ Kadar} = \frac{\text{Berat abu} - ((\text{Berat krus} + \text{abu konstan}) - \text{Berat krus})}{\text{Berat zat}} \times 100\%$$

$$\% \text{ Kadar} = \frac{0,1102 - (32,3949 - 32,3239)}{2,0067} \times 100\% = 1,95\%$$

6. Daya Lekat

Replikasi	Daya lekat (detik)
I	40
II	40
III	40
$\overline{X} \pm SD$	40±0

7. Penentuan pH

Replikasi	pH
I	5,09
II	5,07
III	5,08
$\overline{X} \pm SD$	5,08±0,01

8. Kadar senyawa larut air

Replikasi	Berat cawan (g)	Berat zat (g)	Berat cawan + senyawa konstan (g)	% Kadar
I	44,6456	5,0833	45,2239	11,37
II	40,0704	5,0380	40,5962	10,44
III	42,6145	5,3132	43,1997	10,94
$\overline{X} \pm SD$				10,92±0,46

$$\% \text{ Kadar} = \frac{(\text{Berat cawan} + \text{zat konstan}) - \text{Berat cawan}}{\text{Berat zat}} \times 100\%$$

$$\% \text{ Kadar} = \frac{45,2239 - 44,6456}{5,0833} \times 100\% = 11,37\%$$

9. Kadar senyawa larut etanol

Replikasi	Berat cawan (g)	Berat zat (g)	Berat cawan + senyawa konstan (g)	% Kadar
I	42,2206	5,0155	42,9746	15,03
II	41,4622	5,0600	42,2057	14,69
III	42,3904	4,9861	43,1309	14,85
$\overline{X} \pm SD$				14,85±0,17

$$\% \text{ Kadar} = \frac{(\text{Berat cawan} + \text{zat konstan}) - \text{Berat cawan}}{\text{Berat zat}} \text{x}100\%$$

$$\% \text{ Kadar} = \frac{42,9746 - 42,2206}{5,0155} \text{x}100\% = 15,03\%$$

HASIL UJI MUTU FISIK GRANUL

Mutu Fisik	Rep	Formula Tablet Ekstrak Daun Kemangi Hutan (*Ocimum sanctum* L.)				Persyaratan
		FA	FB	FC	FD	
Kadar air (persen)	1	3,62	3,34	3,42	3,51	3 – 5% (Voigt, 1995)
	2	3,50	3,38	3,40	3,59	
	3	3,43	3,36	3,30	3,42	
$\overline{X} \pm SD$		3,52±0,09	3,36±0,02	3,37±0,06	3,51±0,08	
Waktu alir (detik)	1	9,92	9,94	9,94	9,97	≤ 10 detik (Siregar dan Wikarsa, 2010)
	2	9,93	9,94	9,93	9,95	
	3	9,90	9,93	9,91	9,94	
$\overline{X} \pm SD$		9,92±0,02	9,94±0,01	9,93±0,02	9,95±0,02	
Sudut diam (derajat)	1	30,96	31,79	31,38	32,62	25-40° (US Pharmacopoeial Convention, 2007)
	2	31,38	32,21	31,38	32,21	
	3	32,62	32,21	31,79	32,21	
$\overline{X} \pm SD$		31,65±0,86	32,07±0,24	31,52±0,23	32,34±0,24	
Hausner ratio (persen)	1	1,13	1,13	1,16	1,13	1,00-1,25 (US Pharmacopoeial Convention, 2007)
	2	1,13	1,13	1,13	1,13	
	3	1,16	1,16	1,13	1,13	
$\overline{X} \pm SD$		1,14±0,02	1,14±0,01	1,14±0,02	1,13±0	
Kompresibilitas (persen)	1	11,36	11,63	13,64	11,36	5-20% (US Pharmacopoeial Convention, 2007)
	2	11,36	11,63	11,36	11,36	
	3	13,64	13,64	11,63	11,36	
$\overline{X} \pm SD$		12,12±1,31	12,30±1,16	12,21±1,24	11,36±0	

Contoh perhitungan sudut diam:

W persegi panjang = 5,1141 g

W lingkaran = 1,2782 g

Luas persegi panjang = 709,5 cm^2

Luas lingkaran = $\frac{1,2782}{5,1141} x 709,5 = 177,33$ cm^2

$A = \pi r^2$

$r^2 = \frac{A}{\pi} = \frac{177,33}{3,14} = 56,47$

$r = 7,51$

$$tg \propto = \frac{t}{r} = \frac{4,5}{7,51} = 0,6$$

$$\propto = 30,96°$$

Contoh perhitungan indeks kompresibilitas:

V1 = 100 ml, V2 = 89

% kompresibilitas $= 1 - \frac{V2}{V1} x100\% = 11,36\%$

LAMPIRAN D

HASIL UJI MUTU FISIK TABLET EKSTRAK DAUN KEMANGI HUTAN (*Ocimum sanctum* L.)

1. Keseragaman bobot

Bets 1

No	F A			F B			F C			F D		
	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
1	654,2	646,5	653,4	653,1	653,5	648,9	649,7	642,3	651,5	658,7	657,3	642,8
2	652,2	659,4	646,5	645,7	647,3	651,7	644,9	647,8	647,8	647,3	650,9	653,9
3	648,4	645,6	650,7	647,9	645,9	645,9	650,5	642,3	646,9	651,9	649,7	657,8
4	663,6	655,8	649,1	643,3	651,7	655,1	651,3	653,1	650,1	650,3	646,7	658
5	659,4	655,8	646,0	643,3	649,1	653,2	651,5	650,5	655,7	648,9	645,5	647,1
6	646,2	642,9	656,7	655,3	653,2	651,0	646,9	645,7	653,2	649,1	651,9	650,0
7	655,5	648,6	645,3	655,6	647,9	645,9	651,0	650,0	641,3	650,9	655,5	649,7
8	644,1	647,5	653,7	648,1	641,8	649,9	648,7	645,3	650,9	653,2	653,9	653,5
9	646,7	642,6	647,2	649,2	652,3	647,9	647,1	646,1	648,6	642,9	642,3	654,5
10	647,3	654,4	654,6	647,2	647,9	657,2	652,7	653,5	650,3	645,5	654,3	653,2
11	646,6	651,0	650,4	645,8	651,1	649,1	651,3	651,7	649,1	648,1	643,3	658,3
12	642,5	653,8	644,0	659,1	647,7	649,7	643,1	643,8	644,5	657,2	652,3	656,5
13	667,4	649,4	648,3	652,1	643,2	653,4	645,9	647,3	647,1	656,2	649,8	650,6
14	646,8	653,9	643,7	653,2	645,9	638,7	654,5	652,5	649,3	646,3	645,9	649,7
15	648,1	652,9	656,1	644,1	649,7	636,6	646,4	656,6	655,1	651,7	650,2	643,9
16	647,9	651,9	650,2	638,8	648,5	651,1	651,6	651,6	650,0	649,3	647,1	653,8
17	641,6	655,0	655,7	649,1	648,7	646,0	649,1	652,1	651,3	650,1	643,3	650,0
18	650,6	651,0	652,4	646	649,1	655,7	646,9	646,9	655,2	647,9	656,6	645,9
19	655,9	651,5	647,9	649,1	650,9	656,1	651,0	652,3	651,2	643,9	653,1	647,1
20	650,4	652,9	651,3	652,3	649,9	656,7	645,9	650,0	647,9	655,1	649,7	648,9
X̄	650,7	651,1	650,2	648,9	648,8	649,9	649,0	649,1	649,9	650,2	649,9	651,3
SD	6,80	4,44	4,04	4,96	3,05	5,53	2,97	4,00	3,53	4,27	4,50	4,59

Bets 2

No	F A			F B			F C			F D		
	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
1	647,9	649,9	650,4	652,5	646,6	650,1	642,6	652,1	644,9	653,4	650,6	651,3
2	649,1	647,1	649,6	651,3	653,4	648,3	653,9	655,2	647,9	649,9	644,4	648,9
3	651,5	654,3	650,2	650,3	651,1	643,8	651,7	653,6	650,8	648,2	648,8	647,1
4	650,1	643,7	649,6	650,5	652,9	650,4	652,2	650,5	651,8	649,9	647,6	652,3
5	649,1	649,1	653,3	647,5	652,1	652,5	655,5	648,6	654,7	649,4	653,8	655,1
6	647,3	654,5	645,7	647,7	645,5	643,3	643,2	655,6	645,9	649,6	649,9	643,5
7	653,5	649,7	646,1	643,3	648,7	649,4	646,1	645,7	652,1	648,9	653,4	647,8
8	647,8	647,1	652,3	645,4	644,8	647,6	652,2	647,3	644,1	654,4	649,9	649,9
9	645,5	647,9	655,5	646,6	649	650,5	646,1	644,9	645,8	650,5	650,2	646,7
10	653,7	650,3	653,8	657,9	654,6	656,7	656,6	650,3	648,4	645,6	643,9	653,6
11	647,9	649,3	647,5	654,1	644,7	651,3	649,3	651,4	650,4	645,8	649,4	647,8
12	652,3	651,2	649,9	653,2	650,3	650,3	644,4	647,9	647,5	651	645,6	651,7
13	650,5	644,4	649,4	650,1	654,7	648,6	646,8	643,8	648,6	648	644,9	649,6
14	649,2	655,3	649,9	649,6	652,3	651,8	647,5	652,5	649,9	648,6	655,4	652,2
15	648,6	649,9	647,5	646	651,2	645,6	651,6	649,3	643,6	647,4	650,5	650,5
16	653,2	653,2	654,3	648,3	652,4	647,9	647,4	651,6	642,6	643,8	649,8	655,5
17	645,1	648,3	650,9	647,9	650,1	648,3	648,3	647,9	652,7	647,5	656,1	651,7
18	654,5	649,5	646,7	647,2	648,7	650,8	646,2	646,3	650,2	653,4	655,7	647,4
19	650,3	646,1	653,5	653,7	646,1	651,4	652,2	643,8	647,2	647,6	649,5	653,2
20	647,1	648,5	648,1	644,2	649,1	643,6	655	652,7	648,3	653,2	655,5	650,1
$\overline{X}$	649,7	649,5	650,2	649,5	649,9	649,1	649,4	649,6	648,4	649,3	650,2	650,3
SD	2,72	3,13	2,83	3,66	3,15	3,26	4,17	3,58	3,25	2,80	3,81	3,03

*R= replikasi

2. Keseragaman ukuran

Bets 1

No	F A			F B			F C			F D		
	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
		$d = 1,33$			$d = 1,33$			$d = 1,33$			$d = 1,33$	
1	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445
2	0,445	0,445	0,445	0,445	0,445	0,445	0,450	0,450	0,445	0,445	0,450	0,445
3	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,450	0,445	0,445	0,445
4	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,450
5	0,445	0,445	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445
6	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,450
7	0,445	0,445	0,445	0,445	0,445	0,450	0,445	0,450	0,445	0,450	0,450	0,445
8	0,450	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445
9	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445
10	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,450	0,445	0,450	0,450
11	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445
12	0,450	0,445	0,450	0,445	0,445	0,445	0,450	0,445	0,445	0,450	0,445	0,445
13	0,450	0,445	0,450	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445
14	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445
15	0,445	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,450	0,445	0,445	0,445
16	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445
17	0,445	0,445	0,445	0,445	0,445	0,450	0,450	0,450	0,445	0,445	0,445	0,445
18	0,445	0,450	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445
19	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,450	0,445	0,445
20	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,450	0,450
$\overline{X}$	0,446	0,446	0,446	0,446	0,446	0,446	0,446	0,446	0,446	0,446	0,446	0,446
SD	0,002	0,002	0,002	0,002	0,002	0,002	0,002	0,002	0,002	0,002	0,002	0,002

*d= diameter tablet; R= replikasi

Bets 2

No	F A			F B			F C			F D		
	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
	d = 1,33			d = 1,33			d = 1,33			d = 1,33		
1	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,450	0,445	0,445	0,445
2	0,450	0,445	0,450	0,445	0,445	0,445	0,450	0,445	0,450	0,445	0,445	0,445
3	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,445
4	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,450	0,450
5	0,445	0,450	0,450	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445
6	0,450	0,445	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445
7	0,445	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445
8	0,445	0,445	0,445	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445
9	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445
10	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,445
11	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,450	0,445	0,445
12	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445
13	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,450	0,445
14	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,445
15	0,445	0,445	0,445	0,445	0,450	0,450	0,445	0,450	0,445	0,450	0,445	0,445
16	0,445	0,445	0,445	0,450	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445
17	0,445	0,445	0,445	0,445	0,445	0,445	0,450	0,445	0,450	0,445	0,445	0,450
18	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445
19	0,445	0,445	0,445	0,445	0,445	0,450	0,445	0,445	0,450	0,445	0,450	0,445
20	0,445	0,445	0,445	0,450	0,445	0,445	0,445	0,445	0,445	0,450	0,450	0,445
X̄	0,446	0,446	0,446	0,446	0,446	0,446	0,446	0,446	0,446	0,446	0,446	0,446
SD	0,002	0,002	0,002	0,002	0,002	0,002	0,002	0,002	0,002	0,002	0,002	0,002

*d= diameter tablet; R= replikasi

3. Kekerasan Tablet

Bets 1

No	F A			F B			F C			F D		
	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
1	6,1	6,5	6,4	7,5	8,0	7,4	6,7	6,6	6,1	8,0	7,6	7,9
2	6,5	6,0	6,0	8,0	7,8	7,9	6,4	6,4	6,1	7,3	7,9	7,6
3	6,4	6,1	6,1	7,9	7,9	7,8	6,7	6,6	6,2	7,4	8,0	7,6
4	6,4	6,4	6,1	7,5	7,3	7,2	6,5	6,7	6,7	7,3	7,6	7,5
5	6,5	6,4	6,3	7,3	7,3	7,6	6,0	6,6	6,4	7,5	7,5	7,7
6	6,4	6,1	6,5	7,5	8,0	7,5	6,2	6,4	6,4	7,9	7,7	7,7
7	6,2	6,5	6,7	7,8	7,3	7,2	6,0	6,2	6,5	7,6	7,6	7,2
8	6,5	6,0	6,1	7,9	7,5	7,9	6,4	6,5	6,6	7,3	7,5	7,9
9	6,7	6,2	6,4	7,5	7,4	7,6	6,3	6,7	6,2	7,7	8,0	7,8
10	6,4	6,4	6,1	7,6	7,4	7,5	6,4	6,5	6,4	7,7	7,9	7,4
$\overline{\text{X}}$	6,4	6,3	6,3	7,65	7,59	7,56	6,36	6,52	6,36	7,57	7,73	7,63
SD	0,16	0,20	0,23	0,23	0,29	0,25	0,25	0,15	0,20	0,25	0,20	0,22

*R= replikasi

Bets 2

No	F A			F B			F C			F D		
	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
1	6,6	6,3	6,4	7,9	7,9	7,7	6.8	6.2	6.4	7,2	7,0	7,8
2	6,3	6,3	6,3	8,0	8,0	7,6	6.7	6.6	6.6	7,7	7,2	7,5
3	6,1	6,4	6,6	7,8	7,9	7,9	6.4	6.6	6.2	7,2	7,8	7,2
4	6,3	6,5	6,1	8,0	7,4	7,4	6.4	6.6	6.6	7,4	7,2	7,1
5	6,4	6,4	6,1	7,6	7,8	7,1	6.7	6.3	6.8	7,5	7,8	7,8
6	6,3	6,4	6,4	7,5	7,2	7,8	6.3	6.4	6.2	7,5	7,2	7,8
7	6,6	6,2	6,3	7,8	7,9	7,6	6.2	6.9	6.8	7,6	7,2	7,3
8	6,3	6,1	6,5	7,2	8,0	7,7	6.4	6.5	6.6	7,9	7,8	7,9
9	6,5	6,3	6,2	7,6	7,3	7,8	6.2	6.3	6.3	7,3	7,8	7,8
10	6,1	6,1	6,2	7,3	7,9	7,7	6.6	6.3	6.5	7,2	7,3	7,4
$\overline{\text{X}}$	6,4	6,3	6,3	7,7	7,7	7,6	6.5	6.5	6.5	7,5	7,4	7,6
SD	0,18	0,13	0,17	0,27	0,30	0,23	0.2	0.21	0.22	0,23	0,32	0,30

*R= replikasi

4. Kerapuhan tablet

Bets 1

Formula	Replikasi	Wo (g)	W (g)	Kerapuhan (%)	$\overline{X} \pm SD$
A	I	13,30	13,26	0,30	0,35 ±0,09
	II	13,31	13,25	0,45	
	III	13,26	13,22	0,30	
B	I	13,10	13,09	0,08	0,10 ± 0,04
	II	13,14	13,13	0,08	
	III	13,16	13,14	0,15	
C	I	13,34	13,31	0,22	0,3 ± 0,08
	II	13,18	13,14	0,30	
	III	13,18	13,13	0,38	
D	I	13,40	13,38	0,15	0,12 ± 0,04
	II	13,29	13,28	0,08	
	III	13,25	13,23	0,15	

Bets 2

Formula	Replikasi	Wo (g)	W (g)	Kerapuhan (%)	$\overline{X} \pm SD$
A	I	12,99	12,95	0,31	0,33 ± 0,05
	II	12,94	12,89	0,39	
	III	13,00	12,96	0,31	
B	I	13,42	13,4	0,15	0,12 ± 0,05
	II	13,36	13,35	0,07	
	III	13,35	13,33	0,15	
C	I	13,1	13,05	0,38	0,40 ± 0,04
	II	13,2	13,14	0,45	
	III	13,16	13,11	0,38	
D	I	13,09	13,08	0,08	0,13 ± 0,04
	II	13,15	13,13	0,15	
	III	13,18	13,16	0,15	

5. Waktu Hancur Tablet

Bets 1

Replikasi	Waktu hancur (menit)			
	FA	FB	FC	FD
I	11,20	12,14	8,25	9,1
II	11,19	12,10	8,20	9,09
III	11,25	12,13	8,28	9,12
$\overline{\text{X}} \pm$ SD	11,21 ± 0,03	12,12 ± 0,02	8,24± 0,04	9,1 ± 0,015

Bets 2

Replikasi	Waktu hancur (menit)			
	FA	FB	FC	FD
I	11,15	12,16	8,17	9,15
II	11,18	12,18	8,18	9,20
III	11,23	12,20	8,17	9,18
$\overline{\text{X}} \pm$ SD	11,18 ± 0,04	12,18 ± 0,02	8,17 ± 0,01	9,17 ± 0,03

LAMPIRAN E

HASIL UJI STATISTIK ANTAR BETS

1. Keseragaman Bobot

Formula A

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	6,5068E2	60	5,16432	,66671
	Bets_2	6,4980E2	60	2,87169	,37073

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	60	-,045	,735

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Bets_1 - Bets_2	,88833	6,02014	,77720	-,66683	2,44350	1,143	59	,258

t hitung $0,258 < t_{0,05}$ (59) yaitu 1,67, menunjukkan tidak ada perbedaan bermakna antar bets.

Formula B

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	6,4922E2	60	4,59456	,59315
	Bets_2	6,4949E2	60	3,33364	,43037

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	60	,005	,971

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Bets_1 - Bets_2	-,27000	5,66342	,73114	-1,73302	1,19302	-,369	59	,713

t hitung $0,713 < t_{0,05}$ (59) yaitu 1,67, menunjukkan tidak ada perbedaan bermakna antar bets.

Formula C

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	6,4931E2	60	3,49265	,45090
	Bets_2	6,4912E2	60	3,66836	,47358

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	60	-,013	,919

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Bets_1 - Bets_2	,18667	5,09907	,65829	-1,13056	1,50390	,284	59	,778

t hitung $0,778 < t_{0,05}$ (59) yaitu 1,67, menunjukkan tidak ada perbedaan bermakna antar bets.

Formula D

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	6,5048E2	60	4,42183	,57086
	Bets_2	6,4995E2	60	3,22393	,41621

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	60	,015	,907

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Bets_1 - Bets_2	,53500	5,43216	,70129	-,86828	1,93828	,763	59	,449

t hitung $0,449 < t_{0,05}$ (59) yaitu 1,67, menunjukkan tidak ada perbedaan

bermakna antar bets.

2. Keseragaman Ukuran

Formula A

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	.44583	60	.002092	.000270
	Bets_2	.44575	60	.002022	.000261

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	60	.250	.054

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Pair 1	Bets_1 - Bets_2	.000083	.002520	.000325	-.000568	.000734	.256	59	.799

t hitung 0,256 < $t_{0,05}$ (59) yaitu 1,67, menunjukkan tidak ada perbedaan bermakna antar bets.

Formula B

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	.44567	60	.001946	.000251
	Bets_2	.44567	60	.001714	.000221

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	60	.119	.367

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Pair 1	Bets_1 - Bets_2	.000000	.002436	.000314	-.000629	.000629	.000	59	1.000

t hitung 0,000 < $t_{0,05}$ (59) yaitu 1,67, menunjukkan tidak ada perbedaan bermakna antar bets.

Formula C

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	.44575	60	.001800	.000232
	Bets_2	.44600	60	.002017	.000260

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	60	.023	.860

Paired Samples Test

| | | Paired Differences | | | | | | | |
| | | | | | 95% Confidence Interval of the Difference | | | | |
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Bets_1 - Bets_2	-.000250	.002672	.000345	-.000940	.000440	-.725	59	.471

t hitung 0,725 < $t_{0,05}$ (59) yaitu 1,67, menunjukkan tidak ada perbedaan bermakna antar bets.

Formula D

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	.44592	60	.001951	.000252
	Bets_2	.44575	60	.001800	.000232

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	60	.042	.749

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Pair 1	Bets_1 - Bets_2	.000167	.002598	.000335	-.000505	.000838	.497	59	.621

t hitung $0,497 < t_{0,05}$ (59) yaitu 1,67, menunjukkan tidak ada perbedaan

bermakna antar bets.

3. Kekerasan Tablet
Formula A

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	6,313	30	,2047	,0374
	Bets_2	6,320	30	,1562	,0285

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	30	-,052	,786

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Pair 1	Bets_1 - Bets_2	-,0067	,2638	,0482	-,1052	,0919	-,138	29	,891

t hitung $0,891 < t_{0,05}$ (29) yaitu 1,699, menunjukkan tidak ada perbedaan

bermakna antar bets.

Formula B

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	7,600	30	,2573	,0470
	Bets_2	7,677	30	,2674	,0488

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	30	,100	,598

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Bets_1 - Bets_2	-,0767	,3520	,0643	-,2081	,0548	-1,193	29	,243

t hitung 0,243 < $t_{0,05}$ (29) yaitu 1,699, menunjukkan tidak ada perbedaan

bermakna antar bets.

Formula C

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	6,413	30	,2129	,0389
	Bets_2	6,517	30	,2052	,0375

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	30	,034	,858

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Pair 1	Bets_1 - Bets_2	-,1033	,2906	,0531	-,2119	,0052	-1,947	29	,061

t hitung 0,061 < $t_{0,05}$ (29) yaitu 1,699, menunjukkan tidak ada perbedaan

bermakna antar bets.

Formula D

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	7,643	30	,2285	,0417
	Bets_2	7,483	30	,2890	,0528

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	30	,131	,489

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Pair 1	Bets_1 - Bets_2	,1600	,3440	,0628	,0315	,2885	2,547	29	,016

t hitung 0,016 < $t_{0,05}$ (29) yaitu 1,699, menunjukkan tidak ada perbedaan

bermakna antar bets.

4. Kerapuhan Tablet
Formula A

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	,4000	3	,08660	,05000
	Bets_2	,3367	3	,04619	,02667

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	3	,500	,667

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Bets_1 - Bets_2	,06333	,07506	,04333	-,12311	,24978	1,462	2	,281

t hitung 0,281 < $t_{0,05}$ (2) yaitu 2,92, menunjukkan tidak ada perbedaan

bermakna antar bets.

Formula B

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	,1033	3	,04041	,02333
	Bets_2	,1233	3	,04619	,02667

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	3	,500	,667

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Bets_1 - Bets_2	-,02000	,04359	,02517	-,12828	,08828	-,795	2	,510

t hitung 0,510 < $t_{0,05}$ (2) yaitu 2,92, menunjukkan tidak ada perbedaan

bermakna antar bets.

Formula C

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	,3000	3	,08000	,04619
	Bets_2	,4033	3	,04041	,02333

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	3	,000	1,000

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Bets_1 - Bets_2	-,10333	,08963	,05175	-,32598	,11932	-1,997	2	,184

t hitung 0,184 < $t_{0,05}$ (2) yaitu 2,92, menunjukkan tidak ada perbedaan

bermakna antar bets.

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Formula D

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	,1267	3	,04041	,02333
	Bets_2	,1267	3	,04041	,02333

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	3	-,500	,667

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Pair 1	Bets_1 - Bets_2	,00000	,07000	,04041	-,17389	,17389	,000	2	1,000

t hitung 1,000 < $t_{0,05}$ (2) yaitu 2,92, menunjukkan tidak ada perbedaan

bermakna antar bets,

5. Waktu Hancur
Formula A

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	11,2133	3	,03215	,01856
	Bets_2	11,1867	3	,04041	,02333

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	3	,860	,342

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Bets_1 - Bets_2	,02667	,02082	,01202	-,02504	,07838	2,219	2	,157

t hitung $0,157 < t_{0,05}$ (2) yaitu 2,92, menunjukkan tidak ada perbedaan

bermakna antar bets.

Formula B

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	12,1233	3	,02082	,01202
	Bets_2	12,1800	3	,02000	,01155

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	3	-,240	,846

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Bets_1 - Bets_2	-,05667	,03215	,01856	-,13652	,02319	-3,053	2	,093

t hitung $0,093 < t_{0,05}$ (2) yaitu 2,92, menunjukkan tidak ada perbedaan

bermakna antar bets.

Formula C

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	8,2433	3	,04041	,02333
	Bets_2	8,1733	3	,00577	,00333

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	3	-,929	,242

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	T	df	
Pair 1	Bets_1 - Bets_2	,07000	,04583	,02646	-,04384	,18384	2,646	2	,118

t hitung 0,118 < $t_{0,05}$ (2) yaitu 2,92, menunjukkan tidak ada perbedaan

bermakna antar bets.

Formula D

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bets_1	9,1033	3	,01528	,00882
	Bets_2	9,1767	3	,02517	,01453

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Bets_1 & Bets_2	3	-,217	,861

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Pair 1	Bets_1 - Bets_2	-,07333	,03215	,01856	-,15319	,00652	-3,951	2	,058

t hitung 0,058 < $t_{0,05}$ (2) yaitu 2,92, menunjukkan tidak ada perbedaan

bermakna antar bets.

LAMPIRAN F

HASIL UJI STATISTIK ANTAR FORMULA

1. Keseragaman Bobot

Test of Homogeneity of Variances

Bobot

Levene Statistic	df1	df2	Sig.
,138	7	152	,995

ANOVA

Bobot

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	70,459	7	10,066	1,554	,153
Within Groups	984,292	152	6,476		
Total	1054,751	159			

Multiple Comparisons

Bobot
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Formula A	Formula B	1,46000	,80471	,611	-1,0134	3,9334
	Formula C	1,37667	,80471	,680	-1,0967	3,8500
	Formula D	,20000	,80471	1,000	-2,2734	2,6734
	Formula A_2	,00000	,80471	1,000	-2,4734	2,4734
	Formula B_2	1,46000	,80471	,611	-1,0134	3,9334
	Formula C_2	1,37667	,80471	,680	-1,0967	3,8500
	Formula D_2	,20000	,80471	1,000	-2,2734	2,6734
Formula B	Formula A	-1,46000	,80471	,611	-3,9334	1,0134
	Formula C	-,08333	,80471	1,000	-2,5567	2,3900
	Formula D	-1,26000	,80471	,770	-3,7334	1,2134
	Formula A_2	-1,46000	,80471	,611	-3,9334	1,0134
	Formula B_2	,00000	,80471	1,000	-2,4734	2,4734

	Formula C_2	-,08333	,80471	1,000	-2,5567	2,3900
	Formula D_2	-1,26000	,80471	,770	-3,7334	1,2134
Formula C	Formula A	-1,37667	,80471	,680	-3,8500	1,0967
	Formula B	,08333	,80471	1,000	-2,3900	2,5567
	Formula D	-1,17667	,80471	,826	-3,6500	1,2967
	Formula A_2	-1,37667	,80471	,680	-3,8500	1,0967
	Formula B_2	,08333	,80471	1,000	-2,3900	2,5567
	Formula C_2	,00000	,80471	1,000	-2,4734	2,4734
	Formula D_2	-1,17667	,80471	,826	-3,6500	1,2967
Formula D	Formula A	-,20000	,80471	1,000	-2,6734	2,2734
	Formula B	1,26000	,80471	,770	-1,2134	3,7334
	Formula C	1,17667	,80471	,826	-1,2967	3,6500
	Formula A_2	-,20000	,80471	1,000	-2,6734	2,2734
	Formula B_2	1,26000	,80471	,770	-1,2134	3,7334
	Formula C_2	1,17667	,80471	,826	-1,2967	3,6500
	Formula D_2	,00000	,80471	1,000	-2,4734	2,4734
Formula A_2	Formula A	,00000	,80471	1,000	-2,4734	2,4734
	Formula B	1,46000	,80471	,611	-1,0134	3,9334
	Formula C	1,37667	,80471	,680	-1,0967	3,8500
	Formula D	,20000	,80471	1,000	-2,2734	2,6734
	Formula B_2	1,46000	,80471	,611	-1,0134	3,9334
	Formula C_2	1,37667	,80471	,680	-1,0967	3,8500
	Formula D_2	,20000	,80471	1,000	-2,2734	2,6734
Formula B_2	Formula A	-1,46000	,80471	,611	-3,9334	1,0134
	Formula B	,00000	,80471	1,000	-2,4734	2,4734
	Formula C	-,08333	,80471	1,000	-2,5567	2,3900
	Formula D	-1,26000	,80471	,770	-3,7334	1,2134
	Formula A_2	-1,46000	,80471	,611	-3,9334	1,0134
	Formula C_2	-,08333	,80471	1,000	-2,5567	2,3900
	Formula D_2	-1,26000	,80471	,770	-3,7334	1,2134
Formula C_2	Formula A	-1,37667	,80471	,680	-3,8500	1,0967
	Formula B	,08333	,80471	1,000	-2,3900	2,5567
	Formula C	,00000	,80471	1,000	-2,4734	2,4734
	Formula D	-1,17667	,80471	,826	-3,6500	1,2967
	Formula A_2	-1,37667	,80471	,680	-3,8500	1,0967
	Formula B_2	,08333	,80471	1,000	-2,3900	2,5567

	Formula D_2	-1,17667	,80471	,826	-3,6500	1,2967
Formula D_2	Formula A	-,20000	,80471	1,000	-2,6734	2,2734
	Formula B	1,26000	,80471	,770	-1,2134	3,7334
	Formula C	1,17667	,80471	,826	-1,2967	3,6500
	Formula D	,00000	,80471	1,000	-2,4734	2,4734
	Formula A_2	-,20000	,80471	1,000	-2,6734	2,2734
	Formula B_2	1,26000	,80471	,770	-1,2134	3,7334
	Formula C_2	1,17667	,80471	,826	-1,2967	3,6500

Homogeneous Subsets

Bobot

Tukey HSD

		Subset for alpha = 0,05
Formula	N	1
Formula B	20	649,2233
Formula B_2	20	649,2233
Formula C	20	649,3067
Formula C_2	20	649,3067
Formula D	20	650,4833
Formula D_2	20	650,4833
Formula A	20	650,6833
Formula A_2	20	650,6833
Sig.		,611

Means for groups in homogeneous subsets
are displayed,

Nilai F hitung 1,554 < $F_{0,05}$ (7,152) yaitu 2,07, menunjukkan tidak ada

perbedaan bermakna antar formula.

2. Keseragaman Ukuran

Test of Homogeneity of Variances

Ukuran

Levene Statistic	df1	df2	Sig.
.678	7	152	.691

ANOVA

Ukuran

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.000	7	.000	.202	.985
Within Groups	.000	152	.000		
Total	.000	159			

Multiple Comparisons

Ukuran
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Formula A	Formula B	.000167	.000371	1.000	-.00097	.00131
	Formula C	.000083	.000371	1.000	-.00106	.00122
	Formula D	-.000083	.000371	1.000	-.00122	.00106
	Formula A_2	.000083	.000371	1.000	-.00106	.00122
	Formula B_2	.000167	.000371	1.000	-.00097	.00131
	Formula C_2	-.000167	.000371	1.000	-.00131	.00097
	Formula D_2	.000083	.000371	1.000	-.00106	.00122
Formula B	Formula A	-.000167	.000371	1.000	-.00131	.00097
	Formula C	-.000083	.000371	1.000	-.00122	.00106
	Formula D	-.000250	.000371	.998	-.00139	.00089
	Formula A_2	-.000083	.000371	1.000	-.00122	.00106
	Formula B_2	.000000	.000371	1.000	-.00114	.00114
	Formula C_2	-.000333	.000371	.986	-.00147	.00081
	Formula D_2	-.000083	.000371	1.000	-.00122	.00106
Formula C	Formula A	-.000083	.000371	1.000	-.00122	.00106

	Formula B	.000083	.000371	1.000	-.00106	.00122
	Formula D	-.000167	.000371	1.000	-.00131	.00097
	Formula A_2	.000000	.000371	1.000	-.00114	.00114
	Formula B_2	.000083	.000371	1.000	-.00106	.00122
	Formula C_2	-.000250	.000371	.998	-.00139	.00089
	Formula D_2	.000000	.000371	1.000	-.00114	.00114
Formula D	Formula A	.000083	.000371	1.000	-.00106	.00122
	Formula B	.000250	.000371	.998	-.00089	.00139
	Formula C	.000167	.000371	1.000	-.00097	.00131
	Formula A_2	.000167	.000371	1.000	-.00097	.00131
	Formula B_2	.000250	.000371	.998	-.00089	.00139
	Formula C_2	-.000083	.000371	1.000	-.00122	.00106
	Formula D_2	.000167	.000371	1.000	-.00097	.00131
Formula A_2	Formula A	-.000083	.000371	1.000	-.00122	.00106
	Formula B	.000083	.000371	1.000	-.00106	.00122
	Formula C	.000000	.000371	1.000	-.00114	.00114
	Formula D	-.000167	.000371	1.000	-.00131	.00097
	Formula B_2	.000083	.000371	1.000	-.00106	.00122
	Formula C_2	-.000250	.000371	.998	-.00139	.00089
	Formula D_2	.000000	.000371	1.000	-.00114	.00114
Formula B_2	Formula A	-.000167	.000371	1.000	-.00131	.00097
	Formula B	.000000	.000371	1.000	-.00114	.00114
	Formula C	-.000083	.000371	1.000	-.00122	.00106
	Formula D	-.000250	.000371	.998	-.00139	.00089
	Formula A_2	-.000083	.000371	1.000	-.00122	.00106
	Formula C_2	-.000333	.000371	.986	-.00147	.00081
	Formula D_2	-.000083	.000371	1.000	-.00122	.00106
Formula C_2	Formula A	.000167	.000371	1.000	-.00097	.00131
	Formula B	.000333	.000371	.986	-.00081	.00147
	Formula C	.000250	.000371	.998	-.00089	.00139
	Formula D	.000083	.000371	1.000	-.00106	.00122
	Formula A_2	.000250	.000371	.998	-.00089	.00139
	Formula B_2	.000333	.000371	.986	-.00081	.00147
	Formula D_2	.000250	.000371	.998	-.00089	.00139
Formula D_2	Formula A	-.000083	.000371	1.000	-.00122	.00106
	Formula B	.000083	.000371	1.000	-.00106	.00122

Formula C	.000000	.000371	1.000	-.00114	.00114
Formula D	-.000167	.000371	1.000	-.00131	.00097
Formula A_2	.000000	.000371	1.000	-.00114	.00114
Formula B_2	.000083	.000371	1.000	-.00106	.00122
Formula C_2	-.000250	.000371	.998	-.00139	.00089

Homogeneous Subsets

Ukuran

Tukey HSD

		Subset for alpha = 0.05
Formula	N	1
Formula B_2	20	.44567
Formula B	20	.44567
Formula C	20	.44575
Formula A_2	20	.44575
Formula D_2	20	.44575
Formula A	20	.44583
Formula D	20	.44592
Formula C_2	20	.44600
Sig.		.986

Means for groups in homogeneous subsets are displayed.

Nilai F hitung 0,202 < $F_{0,05}$ (7,152) yaitu 2,07, menunjukkan tidak ada perbedaan bermakna antar formula.

3. Kekerasan Tablet

Test of Homogeneity of Variances

Kekerasan

Levene Statistic	df1	df2	Sig.
2,644	7	72	,017

ANOVA

Kekerasan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	30,270	7	4,324	179,967	,000
Within Groups	1,730	72	,024		
Total	32,000	79			

Multiple Comparisons

Kekerasan
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Formula A	Formula B	-1,29000*	,06932	,000	-1,5064	-1,0736
	Formula C	-,09000	,06932	,897	-,3064	,1264
	Formula D	-1,35000*	,06932	,000	-1,5664	-1,1336
	Formula A_2	-,01000	,06932	1,000	-,2264	,2064
	Formula B_2	-1,37000*	,06932	,000	-1,5864	-1,1536
	Formula C_2	-,21000	,06932	,064	-,4264	,0064
	Formula D_2	-1,18000*	,06932	,000	-1,3964	-,9636
Formula B	Formula A	1,29000*	,06932	,000	1,0736	1,5064
	Formula C	1,20000*	,06932	,000	,9836	1,4164
	Formula D	-,06000	,06932	,988	-,2764	,1564
	Formula A_2	1,28000*	,06932	,000	1,0636	1,4964
	Formula B_2	-,08000	,06932	,942	-,2964	,1364
	Formula C_2	1,08000*	,06932	,000	,8636	1,2964
	Formula D_2	,11000	,06932	,756	-,1064	,3264
Formula C	Formula A	,09000	,06932	,897	-,1264	,3064
	Formula B	-1,20000*	,06932	,000	-1,4164	-,9836
	Formula D	-1,26000*	,06932	,000	-1,4764	-1,0436
	Formula A_2	,08000	,06932	,942	-,1364	,2964
	Formula B_2	-1,28000*	,06932	,000	-1,4964	-1,0636
	Formula C_2	-,12000	,06932	,667	-,3364	,0964
	Formula D_2	-1,09000*	,06932	,000	-1,3064	-,8736

Formula D	Formula A	1,35000*	,06932	,000	1,1336	1,5664
	Formula B	,06000	,06932	,988	-,1564	,2764
	Formula C	1,26000*	,06932	,000	1,0436	1,4764
	Formula A_2	1,34000*	,06932	,000	1,1236	1,5564
	Formula B_2	-,02000	,06932	1,000	-,2364	,1964
	Formula C_2	1,14000*	,06932	,000	,9236	1,3564
	Formula D_2	,17000	,06932	,233	-,0464	,3864
Formula A_2	Formula A	,01000	,06932	1,000	-,2064	,2264
	Formula B	-1,28000*	,06932	,000	-1,4964	-1,0636
	Formula C	-,08000	,06932	,942	-,2964	,1364
	Formula D	-1,34000*	,06932	,000	-1,5564	-1,1236
	Formula B_2	-1,36000*	,06932	,000	-1,5764	-1,1436
	Formula C_2	-,20000	,06932	,091	-,4164	,0164
	Formula D_2	-1,17000*	,06932	,000	-1,3864	-,9536
Formula B_2	Formula A	1,37000*	,06932	,000	1,1536	1,5864
	Formula B	,08000	,06932	,942	-,1364	,2964
	Formula C	1,28000*	,06932	,000	1,0636	1,4964
	Formula D	,02000	,06932	1,000	-,1964	,2364
	Formula A_2	1,36000*	,06932	,000	1,1436	1,5764
	Formula C_2	1,16000*	,06932	,000	,9436	1,3764
	Formula D_2	,19000	,06932	,127	-,0264	,4064
Formula C_2	Formula A	,21000	,06932	,064	-,0064	,4264
	Formula B	-1,08000*	,06932	,000	-1,2964	-,8636
	Formula C	,12000	,06932	,667	-,0964	,3364
	Formula D	-1,14000*	,06932	,000	-1,3564	-,9236
	Formula A_2	,20000	,06932	,091	-,0164	,4164
	Formula B_2	-1,16000*	,06932	,000	-1,3764	-,9436
	Formula D_2	-,97000*	,06932	,000	-1,1864	-,7536
Formula D_2	Formula A	1,18000*	,06932	,000	,9636	1,3964
	Formula B	-,11000	,06932	,756	-,3264	,1064
	Formula C	1,09000*	,06932	,000	,8736	1,3064
	Formula D	-,17000	,06932	,233	-,3864	,0464
	Formula A_2	1,17000*	,06932	,000	,9536	1,3864
	Formula B_2	-,19000	,06932	,127	-,4064	,0264
	Formula C_2	,97000*	,06932	,000	,7536	1,1864

*, The mean difference is significant at the 0,05 level,

Kekerasan
Tukey HSD

Formula	N	Subset for alpha = 0,05	
		1	2
Formula A	10	6,3100	
Formula A_2	10	6,3200	
Formula C	10	6,4000	
Formula C_2	10	6,5200	
Formula D_2	10		7,4900
Formula B	10		7,6000
Formula D	10		7,6600
Formula B_2	10		7,6800
Sig.		,064	,127

Means for groups in homogeneous subsets are displayed,

Nilai F hitung 179,967 > $F_{0,05}$ (7,72) yaitu 2,14, menunjukkan tidak ada perbedaan bermakna antar formula.

4. Kerapuhan Tablet

Test of Homogeneity of Variances

Kerapuhan

Levene Statistic	df1	df2	Sig.
1,022	7	16	,453

ANOVA

Kerapuhan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,328	7	,047	15,184	,000
Within Groups	,049	16	,003		
Total	,378	23			

Multiple Comparisons

Kerapuhan
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Formula A	Formula B	,24667*	,04537	,001	,0896	,4037
	Formula C	,05000	,04537	,947	-,1071	,2071
	Formula D	,22333*	,04537	,003	,0663	,3804
	Formula A_2	,01333	,04537	1,000	-,1437	,1704
	Formula B_2	,22667*	,04537	,003	,0696	,3837
	Formula C_2	-,05333	,04537	,928	-,2104	,1037
	Formula D_2	,22333*	,04537	,003	,0663	,3804
Formula B	Formula A	-,24667*	,04537	,001	-,4037	-,0896
	Formula C	-,19667*	,04537	,009	-,3537	-,0396
	Formula D	-,02333	,04537	,999	-,1804	,1337
	Formula A_2	-,23333*	,04537	,002	-,3904	-,0763
	Formula B_2	-,02000	,04537	1,000	-,1771	,1371
	Formula C_2	-,30000*	,04537	,000	-,4571	-,1429
	Formula D_2	-,02333	,04537	,999	-,1804	,1337
Formula C	Formula A	-,05000	,04537	,947	-,2071	,1071
	Formula B	,19667*	,04537	,009	,0396	,3537
	Formula D	,17333*	,04537	,025	,0163	,3304
	Formula A_2	-,03667	,04537	,990	-,1937	,1204
	Formula B_2	,17667*	,04537	,022	,0196	,3337
	Formula C_2	-,10333	,04537	,361	-,2604	,0537
	Formula D_2	,17333*	,04537	,025	,0163	,3304
Formula D	Formula A	-,22333*	,04537	,003	-,3804	-,0663
	Formula B	,02333	,04537	,999	-,1337	,1804
	Formula C	-,17333*	,04537	,025	-,3304	-,0163
	Formula A_2	-,21000*	,04537	,005	-,3671	-,0529
	Formula B_2	,00333	,04537	1,000	-,1537	,1604
	Formula C_2	-,27667*	,04537	,000	-,4337	-,1196

	Formula D_2	,00000	,04537	1,000	-,1571	,1571
Formula A_2	Formula A	-,01333	,04537	1,000	-,1704	,1437
	Formula B	,23333*	,04537	,002	,0763	,3904
	Formula C	,03667	,04537	,990	-,1204	,1937
	Formula D	,21000*	,04537	,005	,0529	,3671
	Formula B_2	,21333*	,04537	,005	,0563	,3704
	Formula C_2	-,06667	,04537	,812	-,2237	,0904
	Formula D_2	,21000*	,04537	,005	,0529	,3671
Formula B_2	Formula A	-,22667*	,04537	,003	-,3837	-,0696
	Formula B	,02000	,04537	1,000	-,1371	,1771
	Formula C	-,17667*	,04537	,022	-,3337	-,0196
	Formula D	-,00333	,04537	1,000	-,1604	,1537
	Formula A_2	-,21333*	,04537	,005	-,3704	-,0563
	Formula C_2	-,28000*	,04537	,000	-,4371	-,1229
	Formula D_2	-,00333	,04537	1,000	-,1604	,1537
Formula C_2	Formula A	,05333	,04537	,928	-,1037	,2104
	Formula B	,30000*	,04537	,000	,1429	,4571
	Formula C	,10333	,04537	,361	-,0537	,2604
	Formula D	,27667*	,04537	,000	,1196	,4337
	Formula A_2	,06667	,04537	,812	-,0904	,2237
	Formula B_2	,28000*	,04537	,000	,1229	,4371
	Formula D_2	,27667*	,04537	,000	,1196	,4337
Formula D_2	Formula A	-,22333*	,04537	,003	-,3804	-,0663
	Formula B	,02333	,04537	,999	-,1337	,1804
	Formula C	-,17333*	,04537	,025	-,3304	-,0163
	Formula D	,00000	,04537	1,000	-,1571	,1571
	Formula A_2	-,21000*	,04537	,005	-,3671	-,0529
	Formula B_2	,00333	,04537	1,000	-,1537	,1604
	Formula C_2	-,27667*	,04537	,000	-,4337	-,1196

*, The mean difference is significant at the 0,05 level,

Kerapuhan

Tukey HSD

Formula	N	Subset for alpha = 0,05	
		1	2
Formula B	3	,1033	
Formula B_2	3	,1233	
Formula D	3	,1267	
Formula D_2	3	,1267	
Formula C	3		,3000
Formula A_2	3		,3367
Formula A	3		,3500
Formula C_2	3		,4033
Sig.		,999	,361

Means for groups in homogeneous subsets are displayed,

Nilai F hitung 15,184 > $F_{0,05}$ (7,16) yaitu 2,66, menunjukkan tidak ada perbedaan bermakna antar formula.

5. Waktu Hancur Tablet

Test of Homogeneity of Variances

Waktu_hancur

Levene Statistic	df1	df2	Sig.
1,402	7	16	,271

ANOVA

Waktu_hancur

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	59,402	7	8,486	1,125E4	,000
Within Groups	,012	16	,001		
Total	59,414	23			

Multiple Comparisons

Waktu_hancur
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Formula A	Formula B	-,91000*	,02242	,000	-,9876	-,8324
	Formula C	2,97000*	,02242	,000	2,8924	3,0476
	Formula D	2,11000*	,02242	,000	2,0324	2,1876
	Formula A_2	,02667	,02242	,924	-,0510	,1043
	Formula B_2	-,96667*	,02242	,000	-1,0443	-,8890
	Formula C_2	3,04000*	,02242	,000	2,9624	3,1176
	Formula D_2	2,03667*	,02242	,000	1,9590	2,1143
Formula B	Formula A	,91000*	,02242	,000	,8324	,9876
	Formula C	3,88000*	,02242	,000	3,8024	3,9576
	Formula D	3,02000*	,02242	,000	2,9424	3,0976
	Formula A_2	,93667*	,02242	,000	,8590	1,0143
	Formula B_2	-,05667	,02242	,252	-,1343	,0210
	Formula C_2	3,95000*	,02242	,000	3,8724	4,0276
	Formula D_2	2,94667*	,02242	,000	2,8690	3,0243
Formula C	Formula A	-2,97000*	,02242	,000	-3,0476	-2,8924
	Formula B	-3,88000*	,02242	,000	-3,9576	-3,8024
	Formula D	-,86000*	,02242	,000	-,9376	-,7824
	Formula A_2	-2,94333*	,02242	,000	-3,0210	-2,8657
	Formula B_2	-3,93667*	,02242	,000	-4,0143	-3,8590
	Formula C_2	,07000	,02242	,093	-,0076	,1476
	Formula D_2	-,93333*	,02242	,000	-1,0110	-,8557
Formula D	Formula A	-2,11000*	,02242	,000	-2,1876	-2,0324
	Formula B	-3,02000*	,02242	,000	-3,0976	-2,9424
	Formula C	,86000*	,02242	,000	,7824	,9376
	Formula A_2	-2,08333*	,02242	,000	-2,1610	-2,0057
	Formula B_2	-3,07667*	,02242	,000	-3,1543	-2,9990
	Formula C_2	,93000*	,02242	,000	,8524	1,0076
	Formula D_2	-,07333	,02242	,071	-,1510	,0043
Formula A_2	Formula A	-,02667	,02242	,924	-,1043	,0510

	Formula B	-,93667*	,02242	,000	-1,0143	-,8590
	Formula C	2,94333*	,02242	,000	2,8657	3,0210
	Formula D	2,08333*	,02242	,000	2,0057	2,1610
	Formula B_2	-,99333*	,02242	,000	-1,0710	-,9157
	Formula C_2	3,01333*	,02242	,000	2,9357	3,0910
	Formula D_2	2,01000*	,02242	,000	1,9324	2,0876
Formula B_2	Formula A	,96667*	,02242	,000	,8890	1,0443
	Formula B	,05667	,02242	,252	-,0210	,1343
	Formula C	3,93667*	,02242	,000	3,8590	4,0143
	Formula D	3,07667*	,02242	,000	2,9990	3,1543
	Formula A_2	,99333*	,02242	,000	,9157	1,0710
	Formula C_2	4,00667*	,02242	,000	3,9290	4,0843
	Formula D_2	3,00333*	,02242	,000	2,9257	3,0810
Formula C_2	Formula A	-3,04000*	,02242	,000	-3,1176	-2,9624
	Formula B	-3,95000*	,02242	,000	-4,0276	-3,8724
	Formula C	-,07000	,02242	,093	-,1476	,0076
	Formula D	-,93000*	,02242	,000	-1,0076	-,8524
	Formula A_2	-3,01333*	,02242	,000	-3,0910	-2,9357
	Formula B_2	-4,00667*	,02242	,000	-4,0843	-3,9290
	Formula D_2	-1,00333*	,02242	,000	-1,0810	-,9257
Formula D_2	Formula A	-2,03667*	,02242	,000	-2,1143	-1,9590
	Formula B	-2,94667*	,02242	,000	-3,0243	-2,8690
	Formula C	,93333*	,02242	,000	,8557	1,0110
	Formula D	,07333	,02242	,071	-,0043	,1510
	Formula A_2	-2,01000*	,02242	,000	-2,0876	-1,9324
	Formula B_2	-3,00333*	,02242	,000	-3,0810	-2,9257
	Formula C_2	1,00333*	,02242	,000	,9257	1,0810

*, The mean difference is significant at the 0,05 level,

Waktu_hancur

Tukey HSD

Formula	N	Subset for alpha = 0,05			
		1	2	3	4
Formula C_2	3	8,1733			
Formula C	3	8,2433			
Formula D	3		9,1033		
Formula D_2	3		9,1767		
Formula A_2	3			11,1867	
Formula A	3			11,2133	
Formula B	3				12,1233
Formula B_2	3				12,1800
Sig.		,093	,071	,924	,252

Means for groups in homogeneous subsets are displayed,

Nilai F hitung $1,125 > F_{0,05}$ (7,16) yaitu 2,66, menunjukkan tidak ada

perbedaan bermakna antar formula.

LAMPIRAN G

CONTOH PERHITUNGAN *DESIGN EXPERT*

Bahan	Konsentrasi		Prediksi mutu fisik tablet ekstrak daun kemangi hutan
	Nilai notasi	Nilai riil	
PVP K-30	-0,15	2,41	Kekerasan = 6,8 kgf
Ac-Di-Sol	-0,21	2,79	Kerapuhan = 0,25%
			Waktu hancur = 10,41 menit

$$X = \frac{X' - \text{ rata} - \text{rata 2 } level}{\frac{1}{2} \times perbedaan\ level}$$

PVP K-30:

$$-0,15 = \frac{X' - 2,75}{\frac{1}{2} \times 4,5}$$

X' = 2,41

Ac-Di-Sol:

$$-0,21 = \frac{X' - 3}{\frac{1}{2} \times 2}$$

X' = 2,79

LAMPIRAN H

HASIL DETERMINASI SIMPLISIA DAUN KEMANGI HUTAN

(*Ocimum sanctum* L.)

DINAS KESEHATAN PROPINSI JAWA TIMUR
UPT MATERIA MEDICA
Jalan Lahor No.87 Telp. (0341) 593396 Batu (65313)
KOTA BATU

Nomor	:	074 / 0140/A / 101.8 / 2013
Sifat	:	Biasa
Perihal	:	**Determinasi Tanaman Lampes**

Memenuhi permohonan saudara :

Nama	:	HARRIS KRISTANTO
N R P	:	2443010044
Fakultas	:	Fakultas Farmasi
		Universitas Katolik Widya Mandala Surabaya .

1. Perihal determinasi tanaman Lampes

Kingdom	:	Plantae
Sub Kingdom	:	(Tracheobionta (tumbuhan berpembuluh)
Super Divisi	:	Spermatophyta. (Menghasilkan Biji)
Divisi	:	Angiospermae/ Magnoliophyta (Tumbuhan berbunga)
Kelas	:	Dicotyledonae/ Magnoliopsida (Berkeping dua)
Sub Kelas	:	Asteridae
Bangsa	:	Lamiales
Suku/ Famili	:	Lamiaceae / Labiatae
Marga	:	Ocimum
Jenis	:	***Ocimum sanctum* L**
Sinonim	:	-

Kemangi hutan, Jawa : Lampes (Sunda) Lampes (Jawa Tengah) Kemanghi (Madura), Bali Uku-uku, Maluku Lufe-lufe (Ternate)

Kunci determinasi : 1 b -2 b – 3b – 4 b- 6b- 7 b- 9b- 10b- 11b – 12 b- 13 b – 14 a - 16 a - 239 b - 243b – 244 b - 248 b - 249 b- 250 b – 266b - 267 b – 273b - 276 b - 278b- 279 b - 282a- 1a - 2b- 4b - 6b - 7b – 8

Morfologi : **Habitus** : Semak, semusim, tinggi 30-150 cm. **Batang**: pangkal tumpul, Berkayu, segi empat, beralur, bercabang, berbulu, hijau. **Daun** : Tunggal, bulat telur, ujung runcing, tepi bergerigi, pertulangan menyirip, panjang 14-16 mm, lebar 3-6 mm, tangkai panjang _+ 1 cm, hijau. **Bunga** : Majemuk, bentuk tandan, berbulu, daun pelindung bentuk elips, bertangkai pendek, hijau, mahkola bulat telur, putih keunguan. **Buah** : Kotak, coklat tua. **Biji** : Kecil, tiap buan terdiri 4 biji, hitam. **Akar** : tunggang, putih kotor.

2. **Nama Simplisia** : Ocimi sancti Folium /Daun lampes
3. **Kandungan kimia** : Daun Ocimum sanctum di samping mengandung minyak **atsiri** juga mengandung saponin, flavonoida dan tanin. Sedang bijinya mengandung saponin, flavonoida dan polilenol.
4. **Penggunaan** : Penelitian
5. **Daftar Pustaka** :

- Anonim, http//.ww.plantamor.co.cid/ lampes, diakses tanggal 17 Desember 2010
- Anonim, http// www. Warintek.ristek.go.id/ lampes, diakses tanggal 15 Mei 2007
- Kardinan A, Tanaman Pengusir dan Pembasmi Nyamuk, Agromedia Pustaka, 2003.
- Syamsuhidayat, Sri sugati, Hutapea, Johny Ria. *Inventaris Tanaman Obat Indonesia* Departemen Kesehatan Republik Indonesia : Badan Penelitian Dan Pengembangan Kesehatan.
- Steenis,CGGJ Van Dr , *FLORA*, 2008, Pradnya Paramita , Jakarta

Demikian determinasi ini kami buat untuk dipergunakan sebagaimana mestinya

Batu , 17 JUNI 2013
Kepala UPT Materia Medica Batu

Drs. Husin RM, Apt, MKes.
NIP.19611102 199103 1 003

LAMPIRAN I
SERTIFIKAT EUGENOL

nacalai tesque
The quality for certainty.

February 25 2011

Product name : Eugenol

Product number : 15806-42

Grade : EP

Lot number : M1B6774

Package size : 25g

Test Item	Specification	Results
Specific gravity(20/20 deg.-C)	1.065 - 1.071	1.068
Refractive index n20/D	1.539 - 1.543	1.540
Assay(GC)%	min. 97.0	99.7

M. Yamaga

JRS PHARMA **JRS** THE EXCIPIENT FAMILY

VIVASOL®
Croscarmellose Sodium Ph. Eur., NF, JP
CERTIFICATE OF ANALYSIS

Batch-no.: 3201014136
Re-evaluation date: December 2015
Manufacturing date: December 2011

Manufacturing site: Pirna, Germany

Description	Almost white, very hygroscopic powder; practically insoluble in acetone, ethanol, ether and toluene.

Standards	Specification	Batch Result	Reference
Particle size (retained on air jet sieve)			T226F (MCW)
> 75 µm (200 mesh)	max. 2 %	< 2 %*	
> 45 µm (325 mesh)	max. 10 %	< 10 %*	

Pharmacopoeial test items	Specification	Batch Result	Reference
Identification (A, B, C), (1, 2, 3)	passes	passes*	Ph. Eur., NF, JP
Degree of Substitution	0.60 – 0.85	0.77 *	Ph. Eur., NF, JP
Loss on drying	max. 10.0 %	3.9 %	Ph. Eur., NF, JP
pH	5.0 - 7.0	6.1	Ph. Eur., USP, JP
Content of water-soluble material	1.0 -10.0 %	5.1 %	Ph. Eur., NF, JP
Sulphated ash	14.0 – 28.0 %	passes*	Ph. Eur., JP
Settling volume	10.0 – 30.0 ml	15.5 ml	Ph. Eur., NF, JP
Sodium chloride and Sodium glycolate	max. 0.5 %	< 0.5 %*	Ph. Eur., NF, JP
Heavy metals	max. 10 ppm	< 10 ppm*	T CC 043 (CHP)
Arsenic	max. 2 ppm	< 2 ppm*	T CC 043 (CHP)
Residue of Methanol	max. 1.0 %	< 1.0 %*	T CC 019 (CHP)
Total aerobic microbial count	< 100 CFU / g	< 100 CFU / g*	Ph. Eur., USP
Fungi / molds and yeasts	< 20 CFU / g	< 20 CFU / g*	Ph. Eur., USP
E. coli, Pseudomonas aeruginosa	absent in 10 g	absent*	Ph. Eur., USP
Staph. aureus, Salmonella spec.	absent in 10 g	absent*	Ph. Eur., USP

* Results reported are expected results based on periodic testing.

The batch described by this certificate meets the requirements of Ph. Eur., NF and JP monographs for "Croscarmellose Sodium" current edition. It is released on the basis of the results ascertained.

The raw materials, manufacturing process, and product do not contain any of the solvents listed in the Residual Solvents (Ph. Eur.<5.4>, USP<467>) except for Methanol limited to max. 1.0%.

This product may contain raw materials derived from unauthorized genetically modified cotton and is not suitable for the production or marketing of food or dietary supplements in the EC.

Storage recommendation: Protect from excessive heat and moisture. Keep containers closed.

February 24, 2012
AB: 21144363
VSOL P09

Mathias Winkelmann
QUALITY CONTROL
CHP Carbohydrate Pirna

JRS PHARMA **JRS** THE EXCIPIENT FAMILY

VIVAPUR Type **101**,
Microcrystalline Cellulose NF, Ph. Eur., JP
CERTIFICATE OF ANALYSIS

Batch No   6610127243
Re-evaluation date   10/2016
Manufacturing date   10/2012   Manufacturing Site: Weissenborn, Germany

Description

Appearance	White or almost white fine or granular powder
Solubility	Practically insoluble in water, acetone, anhydrous ethanol and toluene; dilute acids and sodium hydroxide solution (50 g / L)

Standards		Specification		Batch result	Reference
Bulk density		0.26 - 0.31 g / mL		0.28 g / mL	NF, JP
Particle size	> 250 µm (60 mesh)	max. 1 %		< 1 %	T226F (MCW)
(retained on air jet sieve)	> 75 µm (200 mesh)	max. 30 %		25 %	
	> 32 µm (469 mesh)	min. 50 %		59 %	
Particle size distribution	d10	15 - 30 µm		22 µm	T220F (MCW)
(Laser diffraction)	d50	45 - 60 µm		74 µm	
	d90	100 - 170 µm		147 µm	

Pharmacopeial test items	Specification	Batch result	Reference
Zinc chloride test (Ident. A (1))	passes	passes*	Ph. Eur., NF, JP
Suspension test (Ident. 2))	passes	passes*	JP
Degree of polymerisation (Ident. B (3))	max. 350	246	Ph. Eur., NF, JP
Solubility (Copper tetrammine solution)	passes	passes*	Ph. Eur.
pH	5.0 - 7.0	6.1	Ph. Eur., USP, JP
Conductivity	max. 50 µS / cm	24 µS / cm	Ph. Eur., NF, JP
Ether soluble substances	max. 0.05 %	0.01 %	Ph. Eur., NF, JP
Water-soluble substances	max. 0.24 %	0.14 %	Ph. Eur., NF, JP
Loss on drying	max. 7.0 %	3.1 %	Ph. Eur., USP, JP
Sulphated ash / residue on ignition	max. 0.05 %	< 0.05 *%	Ph. Eur., USP, JP
Heavy metals	max. 10 ppm	< 10 ppm*	T252F (MCW)
Total aerobic microbial count (TAMC)	max. 100 CFU / g	< 100 CFU / g*	Ph. Eur., USP, JP
Total yeasts and molds count (TYMC)	max. 20 CFU / g	< 20 CFU / g*	Ph. Eur., USP, JP
E. coli, Pseudomonas aeruginosa	absent in 10 g	absent*	Ph. Eur., USP, JP
Staph. aureus, Salmonella spec.	absent in 10 g	absent*	Ph. Eur., USP, JP
Enterobacteriaceae	absent in 1 g	absent*	Ph. Eur.

Additional characteristics**	Test result**	Reference
Degree of brightness**	tested min. 88 % **	T228F (MCW)
Dark particles (Process artifacts)**	tested max. 9 / 600 cm² **	T221F (MCW)
Powder Flow – Angle of repose**	tested max. 45° **	T222F (MCW)

* Results reported are expected results based on periodic testing.
**Results reported are tested result ranges of the batch for information without claiming a certified status.

The batch described by this certificate meets the requirements of Ph. Eur., NF, and JP monographs for "Microcrystalline Cellulose" current edition, it complies with E 460 monograph and all current EU Food Regulations. It is released on the basis of the results ascertained. The raw materials, manufacturing process, and product do not contain any of the solvents listed in Residual Solvents (Ph. Eur.<5.4>, USP<467>).
Storage recommendation: Protect from excessive heat and moisture.
Keep containers closed.

October 29, 2012   B. Herold
Ref.: 3756 / 2/Mv 3559   QC MICROCELLULOSE WEISSENBORN

256101p14_e

LAMPIRAN L
SERTIFIKAT ANALISIS LAKTOSA

DMV-Fonterra Excipients
The ingredients of success
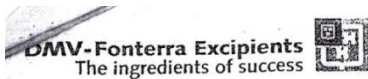
COPY

Certificate of analysis

Issue date
18.09.2012
Purchase order
DMV-21/12
Delivery item
80508557 000050
Order item
384239 000050
Total Quantity Item
5.000 KG

PT Signa Husada
Jl. Daan Mogot Km. 17
11840 Jakarta Barat
Indonesia

Material:
Pharmatose 200M
Lactose Monohydrate USP/NF,Ph.Eur,JP
In multi layer paper bag with a poly-
ethylene innerbag contents 25 kg net.
(EU)

Production site : FrieslandCampina DMV BV, Veghel, The Netherlands
Product name   : Pharmatose 200M
Conforms to USP/NF, Ph.Eur.,JP, Lactose monohydrate monograph, current
at time of manufacture.
Product description: A white or almost white, crystalline powder freely
but slowly soluble in water, practically insoluble
in ethanol

Residual solvents
(CPMP/ICH/283/95) : No class 1,2,3 solvents are used during production
Identification   : Complies with Pharmacopoeia when tested

Lot: 10648471   Quantity: 5.000 KG
Manufacture date: 05.2012   Expiry date: 04.2015

Characteristic	Unit	SPECIFICATION Lower Limit	Upper Limit	Value
Water (KF)	%	4,5	5,5	5,1
Loss on drying	%	0,0	0,5	0,1
Specific rotation 20 °C anhydr	NON	54,4	55,9	55,0
Residue on ignition/Sulph.Ash	%	0,00	0,10	0,04
Absorb.1% , 1cm at 270-300 nm	NON	0,00	0,07	0,01
Absorb.1% , 1cm at 210-220 nm	NON	0,00	0,25	0,03
Absorb.10% , 1cm at 400 nm	NON	0,00	0,04	0,01
Appearance of solution (Ph.Eur Clear and not more coloured than ref.BY7			Passes test	Passes test
Clarity and Colour of Solution Clear and colourless			Passes test	Passes test

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SP SUN PLAN DEVELOPMENT LTD.

CERTIFICATE OF ANALYSIS

INVOICE NO.   1514

TO: PT BRATACO JL. KELENTENG NO. 9
BANDUNG QQ PT BRATACO JL. MANGGA
BESAR V/5 JAKARTA, INDONESIA
NPWP.01.130.689.1-032.001

RE: 48 MT TALC POWDER HAICHEN SHIPPED PER VSL "HUANDAO" V.3192 FROM BAYUQUAN,
CHINA SEAPORT TO TG.PRIOK PORT, JAKARTA, INDONESIA ON/ABOUT 18 OCT 2003
DRAWN UNDER IRREVOCABLE DC NO.03/03U/0645 DD 19SEPT03 OF BANK NISP PT (SWIFT
ADDRESS : NISPIDJA)

COMMODITY : TALC POWDER HAICHEN
QUANTITY   : 48 MT

SiO_2 :	60.1%
MgO :	30.8%
WHITENESS :	92.8%
CaO :	0.4%
:O3 :	0.26%
Al_2O_3 :	0.3%
LOI :	6.0%
FINENESS :	98.5% PASSING THROUGH 325 MESH
PH :	7-9
MOISTURE :	0.38%
ASBESTOS :	FREE

BRATACO
IMPORTER
MANUFACTURER
DISTRIBUTOR

LAMPIRAN N
SERTIFIKAT ANALISIS MAGNESIUM STEARAT

SUN PLAN DEVELOPMENT LTD.

CERTIFICATE OF ANALYSIS

INVOICE NO. 1514

TO: PT BRATACO JL. KELENTENG NO. 8
BANDUNG QQ PT BRATACO JL. MANGGA
BESAR V/5 JAKARTA, INDONESIA
NPWP.01.130.689.1-032.001

RE: 48 MT TALC POWDER HAICHEN SHIPPED PER VSL "HUANDAO" V.3192 FROM BAYUQUAN,
CHINA SEAPORT TO TG.PRIOK PORT, JAKARTA, INDONESIA ON ABOUT 18 OCT 2003
DRAWN UNDER IRREVOCABLE DC NO.03/03U/0645 DD 19SEPT03 OF BANK NISP PT (SWIFT
ADDRESS : NISPIDJA)

COMMODITY : TALC POWDER HAICHEN
QUANTITY   : 48 MT

SiO2 :	60.1%
MgO :	30.8%
WHITENESS :	92.8%
CaO :	0.4%
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BRATACO
IMPORTER
MANUFACTURER
DISTRIBUTOR

LAMPIRAN O

TABEL UJI F

df untuk penyebut (N2)	df untuk pembilang (N1)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	161	199	216	225	230	234	237	239	241	242	243	244	245	245	246
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.40	19.41	19.42	19.42	19.43
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.76	8.74	8.73	8.71	8.70
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.94	5.91	5.89	5.87	5.86
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.70	4.68	4.66	4.64	4.62
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.03	4.00	3.98	3.96	3.94
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.60	3.57	3.55	3.53	3.51
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.31	3.28	3.26	3.24	3.22
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.10	3.07	3.05	3.03	3.01
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.94	2.91	2.89	2.86	2.85
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.82	2.79	2.76	2.74	2.72
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.72	2.69	2.66	2.64	2.62
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.63	2.60	2.58	2.55	2.53
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.57	2.53	2.51	2.48	2.46
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.51	2.48	2.45	2.42	2.40
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.46	2.42	2.40	2.37	2.35
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.41	2.38	2.35	2.33	2.31
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.37	2.34	2.31	2.29	2.27
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.34	2.31	2.28	2.26	2.23
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.31	2.28	2.25	2.22	2.20
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.28	2.25	2.22	2.20	2.18
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.26	2.23	2.20	2.17	2.15
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.24	2.20	2.18	2.15	2.13
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.22	2.18	2.15	2.13	2.11
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.20	2.16	2.14	2.11	2.09
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22	2.18	2.15	2.12	2.09	2.07
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.20	2.17	2.13	2.10	2.08	2.06
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.19	2.15	2.12	2.09	2.06	2.04
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18	2.14	2.10	2.08	2.05	2.03
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.13	2.09	2.06	2.04	2.01
31	4.16	3.30	2.91	2.68	2.52	2.41	2.32	2.25	2.20	2.15	2.11	2.08	2.05	2.03	2.00
32	4.15	3.29	2.90	2.67	2.51	2.40	2.31	2.24	2.19	2.14	2.10	2.07	2.04	2.01	1.99
33	4.14	3.28	2.89	2.66	2.50	2.39	2.30	2.23	2.18	2.13	2.09	2.06	2.03	2.00	1.98
34	4.13	3.28	2.88	2.65	2.49	2.38	2.29	2.23	2.17	2.12	2.08	2.05	2.02	1.99	1.97
35	4.12	3.27	2.87	2.64	2.49	2.37	2.29	2.22	2.16	2.11	2.07	2.04	2.01	1.99	1.96
36	4.11	3.26	2.87	2.63	2.48	2.36	2.28	2.21	2.15	2.11	2.07	2.03	2.00	1.98	1.95
37	4.11	3.25	2.86	2.63	2.47	2.36	2.27	2.20	2.14	2.10	2.06	2.02	2.00	1.97	1.95
38	4.10	3.24	2.85	2.62	2.46	2.35	2.26	2.19	2.14	2.09	2.05	2.02	1.99	1.96	1.94
39	4.09	3.24	2.85	2.61	2.46	2.34	2.26	2.19	2.13	2.08	2.04	2.01	1.98	1.95	1.93
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.04	2.00	1.97	1.95	1.92
41	4.08	3.23	2.83	2.60	2.44	2.33	2.24	2.17	2.12	2.07	2.03	2.00	1.97	1.94	1.92
42	4.07	3.22	2.83	2.59	2.44	2.32	2.24	2.17	2.11	2.06	2.03	1.99	1.96	1.94	1.91
43	4.07	3.21	2.82	2.59	2.43	2.32	2.23	2.16	2.11	2.06	2.02	1.99	1.96	1.93	1.91
44	4.06	3.21	2.82	2.58	2.43	2.31	2.23	2.16	2.10	2.05	2.01	1.98	1.95	1.92	1.90
45	4.06	3.20	2.81	2.58	2.42	2.31	2.22	2.15	2.10	2.05	2.01	1.97	1.94	1.92	1.89

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df untuk penyebut (N2)	df untuk pembilang (N1)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
46	4.05	3.20	2.81	2.57	2.42	2.30	2.22	2.15	2.09	2.04	2.00	1.97	1.94	1.91	1.89
47	4.05	3.20	2.80	2.57	2.41	2.30	2.21	2.14	2.09	2.04	2.00	1.96	1.93	1.91	1.88
48	4.04	3.19	2.80	2.57	2.41	2.29	2.21	2.14	2.08	2.03	1.99	1.96	1.93	1.90	1.88
49	4.04	3.19	2.79	2.56	2.40	2.29	2.20	2.13	2.08	2.03	1.99	1.96	1.93	1.90	1.88
50	4.03	3.18	2.79	2.56	2.40	2.29	2.20	2.13	2.07	2.03	1.99	1.95	1.92	1.89	1.87
51	4.03	3.18	2.79	2.55	2.40	2.28	2.20	2.13	2.07	2.02	1.98	1.95	1.92	1.89	1.87
52	4.03	3.18	2.78	2.55	2.39	2.28	2.19	2.12	2.07	2.02	1.98	1.94	1.91	1.89	1.86
53	4.02	3.17	2.78	2.55	2.39	2.28	2.19	2.12	2.06	2.01	1.97	1.94	1.91	1.88	1.86
54	4.02	3.17	2.78	2.54	2.39	2.27	2.18	2.12	2.06	2.01	1.97	1.94	1.91	1.88	1.86
55	4.02	3.16	2.77	2.54	2.38	2.27	2.18	2.11	2.06	2.01	1.97	1.93	1.90	1.88	1.85
56	4.01	3.16	2.77	2.54	2.38	2.27	2.18	2.11	2.05	2.00	1.96	1.93	1.90	1.87	1.85
57	4.01	3.16	2.77	2.53	2.38	2.26	2.18	2.11	2.05	2.00	1.96	1.93	1.90	1.87	1.85
58	4.01	3.16	2.76	2.53	2.37	2.26	2.17	2.10	2.05	2.00	1.96	1.92	1.89	1.87	1.84
59	4.00	3.15	2.76	2.53	2.37	2.26	2.17	2.10	2.04	2.00	1.96	1.92	1.89	1.86	1.84
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99	1.95	1.92	1.89	1.86	1.84
61	4.00	3.15	2.76	2.52	2.37	2.25	2.16	2.09	2.04	1.99	1.95	1.91	1.88	1.86	1.83
62	4.00	3.15	2.75	2.52	2.36	2.25	2.16	2.09	2.03	1.99	1.95	1.91	1.88	1.85	1.83
63	3.99	3.14	2.75	2.52	2.36	2.25	2.16	2.09	2.03	1.98	1.94	1.91	1.88	1.85	1.83
64	3.99	3.14	2.75	2.52	2.36	2.24	2.16	2.09	2.03	1.98	1.94	1.91	1.88	1.85	1.83
65	3.99	3.14	2.75	2.51	2.36	2.24	2.15	2.08	2.03	1.98	1.94	1.90	1.87	1.85	1.82
66	3.99	3.14	2.74	2.51	2.35	2.24	2.15	2.08	2.03	1.98	1.94	1.90	1.87	1.84	1.82
67	3.98	3.13	2.74	2.51	2.35	2.24	2.15	2.08	2.02	1.98	1.93	1.90	1.87	1.84	1.82
68	3.98	3.13	2.74	2.51	2.35	2.24	2.15	2.08	2.02	1.97	1.93	1.90	1.87	1.84	1.82
69	3.98	3.13	2.74	2.50	2.35	2.23	2.15	2.08	2.02	1.97	1.93	1.90	1.86	1.84	1.81
70	3.98	3.13	2.74	2.50	2.35	2.23	2.14	2.07	2.02	1.97	1.93	1.89	1.86	1.84	1.81
71	3.98	3.13	2.73	2.50	2.34	2.23	2.14	2.07	2.01	1.97	1.93	1.89	1.86	1.83	1.81
72	3.97	3.12	2.73	2.50	2.34	2.23	2.14	2.07	2.01	1.96	1.92	1.89	1.86	1.83	1.81
73	3.97	3.12	2.73	2.50	2.34	2.23	2.14	2.07	2.01	1.96	1.92	1.89	1.86	1.83	1.81
74	3.97	3.12	2.73	2.50	2.34	2.22	2.14	2.07	2.01	1.96	1.92	1.89	1.85	1.83	1.80
75	3.97	3.12	2.73	2.49	2.34	2.22	2.13	2.06	2.01	1.96	1.92	1.88	1.85	1.83	1.80
76	3.97	3.12	2.72	2.49	2.33	2.22	2.13	2.06	2.01	1.96	1.92	1.88	1.85	1.82	1.80
77	3.97	3.12	2.72	2.49	2.33	2.22	2.13	2.06	2.00	1.96	1.92	1.88	1.85	1.82	1.80
78	3.96	3.11	2.72	2.49	2.33	2.22	2.13	2.06	2.00	1.95	1.91	1.88	1.85	1.82	1.80
79	3.96	3.11	2.72	2.49	2.33	2.22	2.13	2.06	2.00	1.95	1.91	1.88	1.85	1.82	1.79
80	3.96	3.11	2.72	2.49	2.33	2.21	2.13	2.06	2.00	1.95	1.91	1.88	1.84	1.82	1.79
81	3.96	3.11	2.72	2.48	2.33	2.21	2.12	2.05	2.00	1.95	1.91	1.87	1.84	1.82	1.79
82	3.96	3.11	2.72	2.48	2.33	2.21	2.12	2.05	2.00	1.95	1.91	1.87	1.84	1.81	1.79
83	3.96	3.11	2.71	2.48	2.32	2.21	2.12	2.05	1.99	1.95	1.91	1.87	1.84	1.81	1.79
84	3.95	3.11	2.71	2.48	2.32	2.21	2.12	2.05	1.99	1.95	1.90	1.87	1.84	1.81	1.79
85	3.95	3.10	2.71	2.48	2.32	2.21	2.12	2.05	1.99	1.94	1.90	1.87	1.84	1.81	1.79
86	3.95	3.10	2.71	2.48	2.32	2.21	2.12	2.05	1.99	1.94	1.90	1.87	1.84	1.81	1.78
87	3.95	3.10	2.71	2.48	2.32	2.20	2.12	2.05	1.99	1.94	1.90	1.87	1.83	1.81	1.78
88	3.95	3.10	2.71	2.48	2.32	2.20	2.12	2.05	1.99	1.94	1.90	1.86	1.83	1.81	1.78
89	3.95	3.10	2.71	2.47	2.32	2.20	2.11	2.04	1.99	1.94	1.90	1.86	1.83	1.80	1.78
90	3.95	3.10	2.71	2.47	2.32	2.20	2.11	2.04	1.99	1.94	1.90	1.86	1.83	1.80	1.78

df untuk penyebut (N2)	df untuk pembilang (N1)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
91	3.95	3.10	2.70	2.47	2.31	2.20	2.11	2.04	1.98	1.94	1.90	1.86	1.83	1.80	1.78
92	3.94	3.10	2.70	2.47	2.31	2.20	2.11	2.04	1.98	1.94	1.89	1.86	1.83	1.80	1.78
93	3.94	3.09	2.70	2.47	2.31	2.20	2.11	2.04	1.98	1.93	1.89	1.86	1.83	1.80	1.78
94	3.94	3.09	2.70	2.47	2.31	2.20	2.11	2.04	1.98	1.93	1.89	1.86	1.83	1.80	1.77
95	3.94	3.09	2.70	2.47	2.31	2.20	2.11	2.04	1.98	1.93	1.89	1.86	1.82	1.80	1.77
96	3.94	3.09	2.70	2.47	2.31	2.19	2.11	2.04	1.98	1.93	1.89	1.85	1.82	1.80	1.77
97	3.94	3.09	2.70	2.47	2.31	2.19	2.11	2.04	1.98	1.93	1.89	1.85	1.82	1.80	1.77
98	3.94	3.09	2.70	2.46	2.31	2.19	2.10	2.03	1.98	1.93	1.89	1.85	1.82	1.79	1.77
99	3.94	3.09	2.70	2.46	2.31	2.19	2.10	2.03	1.98	1.93	1.89	1.85	1.82	1.79	1.77
100	3.94	3.09	2.70	2.46	2.31	2.19	2.10	2.03	1.97	1.93	1.89	1.85	1.82	1.79	1.77
101	3.94	3.09	2.69	2.46	2.30	2.19	2.10	2.03	1.97	1.93	1.88	1.85	1.82	1.79	1.77
102	3.93	3.09	2.69	2.46	2.30	2.19	2.10	2.03	1.97	1.92	1.88	1.85	1.82	1.79	1.77
103	3.93	3.08	2.69	2.46	2.30	2.19	2.10	2.03	1.97	1.92	1.88	1.85	1.82	1.79	1.76
104	3.93	3.08	2.69	2.46	2.30	2.19	2.10	2.03	1.97	1.92	1.88	1.85	1.82	1.79	1.76
105	3.93	3.08	2.69	2.46	2.30	2.19	2.10	2.03	1.97	1.92	1.88	1.85	1.81	1.79	1.76
106	3.93	3.08	2.69	2.46	2.30	2.19	2.10	2.03	1.97	1.92	1.88	1.84	1.81	1.79	1.76
107	3.93	3.08	2.69	2.46	2.30	2.18	2.10	2.03	1.97	1.92	1.88	1.84	1.81	1.79	1.76
108	3.93	3.08	2.69	2.46	2.30	2.18	2.10	2.03	1.97	1.92	1.88	1.84	1.81	1.78	1.76
109	3.93	3.08	2.69	2.45	2.30	2.18	2.09	2.02	1.97	1.92	1.88	1.84	1.81	1.78	1.76
110	3.93	3.08	2.69	2.45	2.30	2.18	2.09	2.02	1.97	1.92	1.88	1.84	1.81	1.78	1.76
111	3.93	3.08	2.69	2.45	2.30	2.18	2.09	2.02	1.97	1.92	1.88	1.84	1.81	1.78	1.76
112	3.93	3.08	2.69	2.45	2.30	2.18	2.09	2.02	1.96	1.92	1.88	1.84	1.81	1.78	1.76
113	3.93	3.08	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.92	1.87	1.84	1.81	1.78	1.76
114	3.92	3.08	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.87	1.84	1.81	1.78	1.75
115	3.92	3.08	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.87	1.84	1.81	1.78	1.75
116	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.87	1.84	1.81	1.78	1.75
117	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.87	1.84	1.80	1.78	1.75
118	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.87	1.84	1.80	1.78	1.75
119	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.87	1.83	1.80	1.78	1.75
120	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.87	1.83	1.80	1.78	1.75
121	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96	1.91	1.87	1.83	1.80	1.77	1.75
122	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96	1.91	1.87	1.83	1.80	1.77	1.75
123	3.92	3.07	2.68	2.45	2.29	2.17	2.08	2.01	1.96	1.91	1.87	1.83	1.80	1.77	1.75
124	3.92	3.07	2.68	2.44	2.29	2.17	2.08	2.01	1.96	1.91	1.87	1.83	1.80	1.77	1.75
125	3.92	3.07	2.68	2.44	2.29	2.17	2.08	2.01	1.96	1.91	1.87	1.83	1.80	1.77	1.75
126	3.92	3.07	2.68	2.44	2.29	2.17	2.08	2.01	1.95	1.91	1.87	1.83	1.80	1.77	1.75
127	3.92	3.07	2.68	2.44	2.29	2.17	2.08	2.01	1.95	1.91	1.86	1.83	1.80	1.77	1.75
128	3.92	3.07	2.68	2.44	2.29	2.17	2.08	2.01	1.95	1.91	1.86	1.83	1.80	1.77	1.75
129	3.91	3.07	2.67	2.44	2.28	2.17	2.08	2.01	1.95	1.90	1.86	1.83	1.80	1.77	1.74
130	3.91	3.07	2.67	2.44	2.28	2.17	2.08	2.01	1.95	1.90	1.86	1.83	1.80	1.77	1.74
131	3.91	3.07	2.67	2.44	2.28	2.17	2.08	2.01	1.95	1.90	1.86	1.83	1.80	1.77	1.74
132	3.91	3.06	2.67	2.44	2.28	2.17	2.08	2.01	1.95	1.90	1.86	1.83	1.79	1.77	1.74
133	3.91	3.06	2.67	2.44	2.28	2.17	2.08	2.01	1.95	1.90	1.86	1.83	1.79	1.77	1.74
134	3.91	3.06	2.67	2.44	2.28	2.17	2.08	2.01	1.95	1.90	1.86	1.83	1.79	1.77	1.74
135	3.91	3.06	2.67	2.44	2.28	2.17	2.08	2.01	1.95	1.90	1.86	1.82	1.79	1.77	1.74

LAMPIRAN P

TABEL UJI t

Pr\df	0.25\0.50	0.10\0.20	0.05\0.10	0.025\0.050	0.01\0.02	0.005\0.010	0.001\0.002
1	1.00000	3.07768	6.31375	12.70620	31.82052	63.65674	318.30884
2	0.81650	1.88562	2.91999	4.30265	6.96456	9.92484	22.32712
3	0.76489	1.63774	2.35336	3.18245	4.54070	5.84091	10.21453
4	0.74070	1.53321	2.13185	2.77645	3.74695	4.60409	7.17318
5	0.72669	1.47588	2.01505	2.57058	3.36493	4.03214	5.89343
6	0.71756	1.43976	1.94318	2.44691	3.14267	3.70743	5.20763
7	0.71114	1.41492	1.89458	2.36462	2.99795	3.49948	4.78529
8	0.70639	1.39682	1.85955	2.30600	2.89646	3.35539	4.50079
9	0.70272	1.38303	1.83311	2.26216	2.82144	3.24984	4.29681
10	0.69981	1.37218	1.81246	2.22814	2.76377	3.16927	4.14370
11	0.69745	1.36343	1.79588	2.20099	2.71808	3.10581	4.02470
12	0.69548	1.35622	1.78229	2.17881	2.68100	3.05454	3.92963
13	0.69383	1.35017	1.77093	2.16037	2.65031	3.01228	3.85198
14	0.69242	1.34503	1.76131	2.14479	2.62449	2.97684	3.78739
15	0.69120	1.34061	1.75305	2.13145	2.60248	2.94671	3.73283
16	0.69013	1.33676	1.74588	2.11991	2.58349	2.92078	3.68615
17	0.68920	1.33338	1.73961	2.10982	2.56693	2.89823	3.64577
18	0.68836	1.33039	1.73406	2.10092	2.55238	2.87844	3.61048
19	0.68762	1.32773	1.72913	2.09302	2.53948	2.86093	3.57940
20	0.68695	1.32534	1.72472	2.08596	2.52798	2.84534	3.55181
21	0.68635	1.32319	1.72074	2.07961	2.51765	2.83136	3.52715
22	0.68581	1.32124	1.71714	2.07387	2.50832	2.81876	3.50499
23	0.68531	1.31946	1.71387	2.06866	2.49987	2.80734	3.48496
24	0.68485	1.31784	1.71088	2.06390	2.49216	2.79694	3.46678
25	0.68443	1.31635	1.70814	2.05954	2.48511	2.78744	3.45019
26	0.68404	1.31497	1.70562	2.05553	2.47863	2.77871	3.43500
27	0.68368	1.31370	1.70329	2.05183	2.47266	2.77068	3.42103
28	0.68335	1.31253	1.70113	2.04841	2.46714	2.76326	3.40816
29	0.68304	1.31143	1.69913	2.04523	2.46202	2.75639	3.39624
30	0.68276	1.31042	1.69726	2.04227	2.45726	2.75000	3.38518
31	0.68249	1.30946	1.69552	2.03951	2.45282	2.74404	3.37490
32	0.68223	1.30857	1.69389	2.03693	2.44868	2.73848	3.36531
33	0.68200	1.30774	1.69236	2.03452	2.44479	2.73328	3.35634
34	0.68177	1.30695	1.69092	2.03224	2.44115	2.72839	3.34793
35	0.68156	1.30621	1.68957	2.03011	2.43772	2.72381	3.34005
36	0.68137	1.30551	1.68830	2.02809	2.43449	2.71948	3.33262
37	0.68118	1.30485	1.68709	2.02619	2.43145	2.71541	3.32563
38	0.68100	1.30423	1.68595	2.02439	2.42857	2.71156	3.31903
39	0.68083	1.30364	1.68488	2.02269	2.42584	2.70791	3.31279
40	0.68067	1.30308	1.68385	2.02108	2.42326	2.70446	3.30688