BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

Kesimpulan yang didapat berdasarkan hasil penelitian adalah:

Formulasi tablet vitamin B6 dengan variasi konsentrasi amilum laktosa (1:1, 2:1, 1:2) dapat menghasilkan tablet dengan kekerasan tinggi dan kerapuhan rendah. Formula tablet vitamin B6 dengan konsentrasi amilum laktosa (1:1) menghasilkan waktu hancur lebih cepat dibandingkan dengan formula lainnya. Sedangkan formula 3 memberikan kerapuhan paling rendah dibandingkan formula 1 dan 2, hal ini disebabkan semakin besar bahan pengisi yang digunakan akan menyebabkan kekuatan antar partikel penyusun yang semakin kuat sehingga menghasilkan tablet yang kompak dan kerapuhan yang rendah.

B. Saran

Perlu dilakukan penilitian lebih lanjut menggunakan bahan tambahan granulatum simplek dengan campuran amilum dan laktosa yang berbeda dengan bahan aktif vitamin B6.

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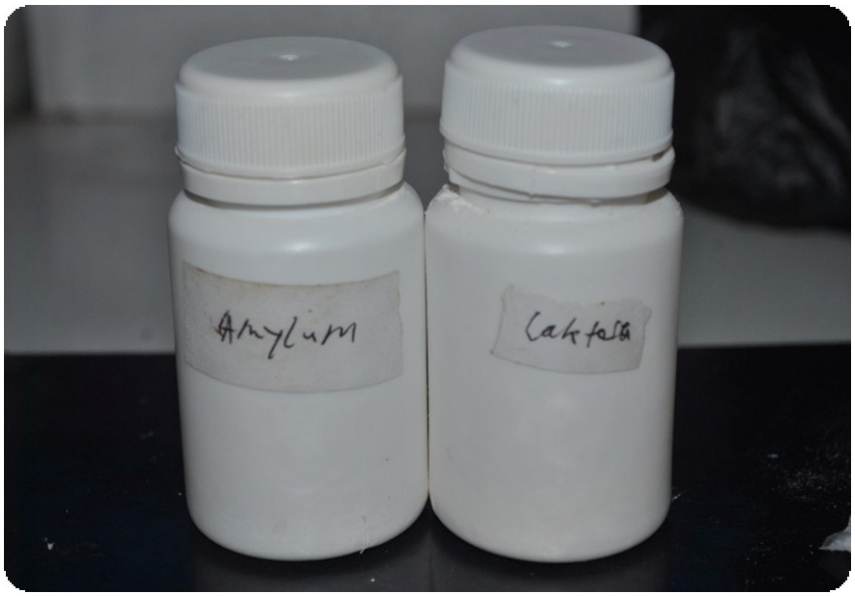
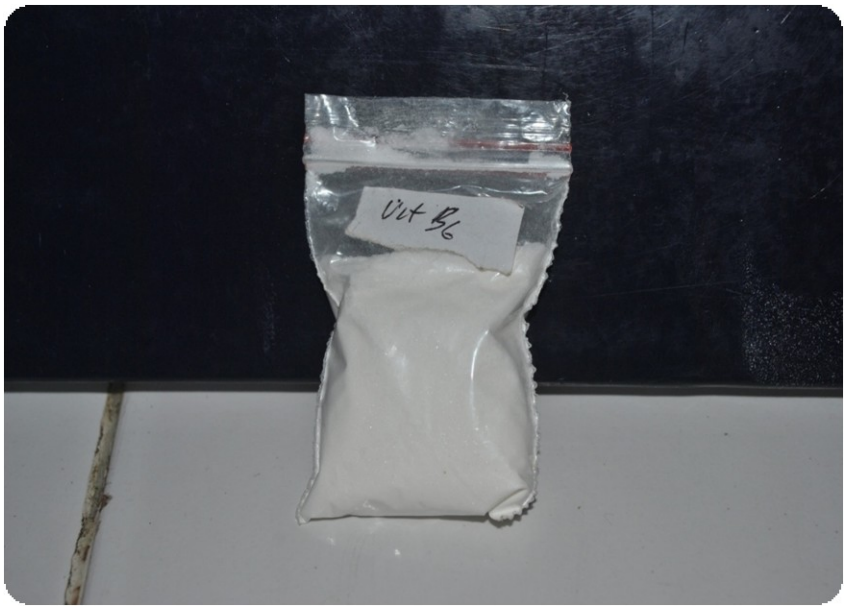
Lampiran 1. Foto bahan penelitian

Lampiran Gambar

Amilum dan Laktosa



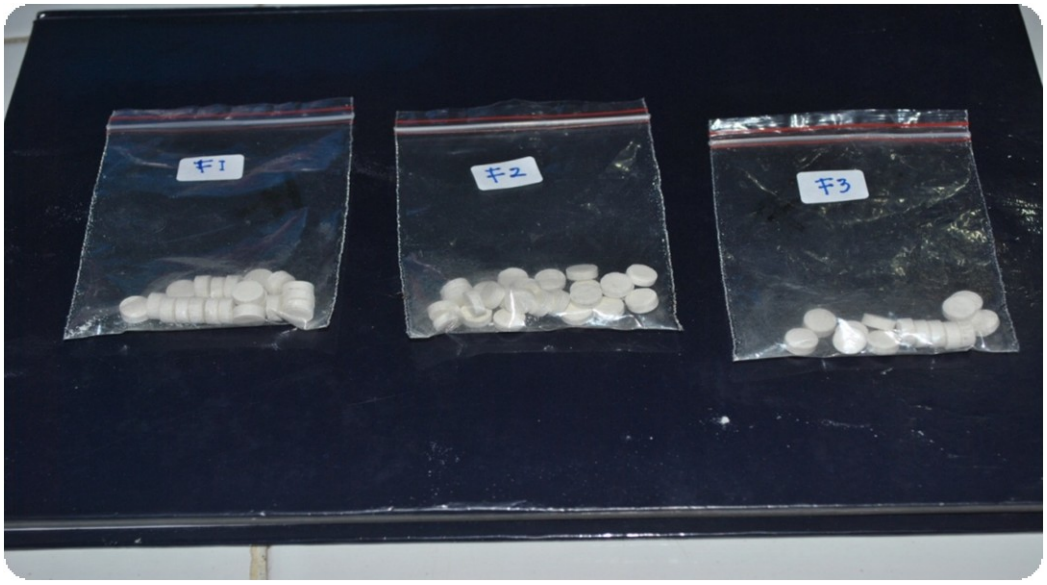
Vitamin B6



Mg Stearat

Formula I, II dan III

Tablet Formula I, II dan III



Lampiran 2. Gambar alat penguji mutu fisik tablet

HARDNESS TESTER

FRIABILATOR

DISINTEGRATION TESTER

Lampiran 3. Data waktu alir

LAMPIRAN HITUNGAN

WAKTU ALIR DALAM 100 GRAM

NO	F1 (1:1) Dalam detik	F2 (2:1) Dalam detik	F3 (1:2) Dalam detik
1	5.9	6.4	5.0
2	5.7	6.2	5.3
3	5.8	6.1	5.4
$\bar{x}$	5.8	6.23	5.23
SD	0.1000	0.1528	0.2082

Lampiran 4. Uji kadar air

UJI KADAR AIR

Berat (gram)	F1 (1:1)	F2 (2:1)	F3 (1:2)
Berat mula-mula	21.690	23.112	23.122
Berat konstan	21.530	22.898	22.990
LOD (%)	0.73 %	0.92 %	0.57 %

Contoh perhitungan kadar air granul:
FORMULA GRANULATUM SIMPLEK 1:1
Botol timbang + sampel = 20.550
Bobot konstan = 21.530

$$\% \text{ LOD} = \frac{berat\ \ sampel\ \ basa\,h - berat\ \ sampel\ \ kering}{berat\ \ sampel\ \ basa\,h} \text{ x } 100\%$$

$$\% \text{ LOD} = \frac{21.690 - 21.530}{21.690} \text{ x } 100\%$$

$$= 0.73\%$$

Lampiran 5. Uji keseragaman bobot

UJI KESERAGAMAN BOBOT

No	F1 (1:1) Bobot dalam mg	F2 (2:1) Bobot dalam mg	F3 (1:2) Bobot dalam mg
1	243	243	245
2	239	237	244
3	236	230	228
4	229	232	240
5	238	231	240
6	240	249	243
7	238	239	248
8	240	246	250
9	241	238	236
10	243	239	247
11	245	238	245
12	241	236	246
13	239	240	235
14	240	242	245
15	248	241	239
16	244	237	241
17	224	245	235
18	242	244	238
19	233	248	240
20	230	251	243
$\bar{x}$	**238.65**	**240.3**	**241.4**
SD	**5.824**	**5.823**	**5.305**
CV	**2.44 %**	**2.42 %**	**2.20 %**

Lampiran 6. Uji kekerasan tablet

UJI KEKERASAN TABLET

No	F1 (1:1) Kekerasan dalam kg	F2 (2:1) Kekerasan dalam kg	F3 (1:2) Kekerasan dalam kg
1	5.2	7.6	6.9
2	6.3	7.2	7.2
3	6.1	6.9	7.1
4	6.7	8.1	7.1
5	6.8	6.9	6.6
6	6.9	6.8	6.9
7	6.3	6.4	8.9
8	6.7	6.9	7.2
9	6.2	7.2	8.1
10	6.6	5.2	6.3
$\bar{x}$	**6.38**	**6.92**	**7.23**
SD	**0.4962**	**0.7642**	**0.7499**

Lampiran 6. Uji kerapuhan tablet

UJI KERAPUHAN TABLET

NO	F1 (1:1) dalam %	F2 (2:1) dalam %	F3 (1:2) dalam %
1	0.13	0.13	0.09
2	0.15	0.14	0.07
3	0.2	0.15	0.12
$\bar{x}$	**0.16**	**0.14**	**0.093**
SD	**0.03606**	**0.01000**	**0.02517**

Contoh perhitungan uji kerapuhan tablet:

Formula 1 amilum: laktosa (1:1)

Berat mula- mula (a) = 3.9802

Berat akhir (b) = 3.975 gram

Angka kerapuhan (%f) $= \frac{a-b}{a}$ x 100%

$= \frac{3.9802}{3.975}$ x 100%

= 0.15 %

Lampiran 8. Data uji waktu hancur tablet

1. UJI WAKTU HANCUR TABLET

No	F1 (1:1) Dalam detik	F2 (2:1) Dalam detik	F3 (1:2) Dalam detik
1	240	303	345
2	248	307	327
3	270	310	309
4	250	311	332
5	280	321	341
6	232	315	352
$\overline{x}$	**253.3333**	**311.1667**	**334.3333**
SD	**18.228**	**6.274**	**15.306**

Lampiran 9. Hasil uji statistik

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
uji waktu alir	9	5.756	.4558	5.0	6.4

One-Sample Kolmogorov-Smirnov Test

		uji waktu alir
N		9
Normal Parameters[a,,b]	Mean	5.756
	Std. Deviation	.4558
Most Extreme Differences	Absolute	.118
	Positive	.116
	Negative	-.118
Kolmogorov-Smirnov Z		.354
Asymp. Sig. (2-tailed)		1.000

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

uji waktu alir

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	5.800	.1000	.0577	5.552	6.048	5.7	5.9
2	3	6.233	.1528	.0882	5.854	6.613	6.1	6.4
3	3	5.233	.2082	.1202	4.716	5.750	5.0	5.4
Total	9	5.756	.4558	.1519	5.405	6.106	5.0	6.4

Test of Homogeneity of Variances

uji waktu alir

Levene Statistic	df1	df2	Sig.
1.171	2	6	.372

ANOVA

uji waktu alir

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.509	2	.754	29.522	.001
Within Groups	.153	6	.026		
Total	1.662	8			

Post Hoc Tests

Multiple Comparisons

uji waktu alir

LSD

(I) formula	(J) formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-.4333*	.1305	.016	-.753	-.114
	3	.5667*	.1305	.005	.247	.886
2	1	.4333*	.1305	.016	.114	.753
	3	1.0000*	.1305	.000	.681	1.319
3	1	-.5667*	.1305	.005	-.886	-.247
	2	-1.0000*	.1305	.000	-1.319	-.681

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

Uji keseragaman bobot

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
uji keseragaman bobot	60	240.12	5.675	224	251

One-Sample Kolmogorov-Smirnov Test

		uji keseragaman bobot
N		60
Normal Parameters[a,,b]	Mean	240.12
	Std. Deviation	5.675
Most Extreme Differences	Absolute	.105
	Positive	.046
	Negative	-.105
Kolmogorov-Smirnov Z		.810
Asymp. Sig. (2-tailed)		.528

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

uji keseragaman bobot

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	20	238.65	5.824	1.302	235.92	241.38	224	248
2	20	240.30	5.823	1.302	237.57	243.03	230	251
3	20	241.40	5.305	1.186	238.92	243.88	228	250
Total	60	240.12	5.675	.733	238.65	241.58	224	251

Test of Homogeneity of Variances

uji keseragaman bobot

Levene Statistic	df1	df2	Sig.
.092	2	57	.912

ANOVA

uji keseragaman bobot

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	76.633	2	38.317	1.198	.309
Within Groups	1823.550	57	31.992		
Total	1900.183	59			

post Hoc Tests

uji keseragaman bobot

LSD

(I) formula	(J) formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-1.650	1.789	.360	-5.23	1.93
	3	-2.750	1.789	.130	-6.33	.83
2	1	1.650	1.789	.360	-1.93	5.23
	3	-1.100	1.789	.541	-4.68	2.48
3	1	2.750	1.789	.130	-.83	6.33
	2	1.100	1.789	.541	-2.48	4.68

Uji kekerasan

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
uji kekerasan tablet	30	6.843	.7482	5.2	8.9

One-Sample Kolmogorov-Smirnov Test

		uji kekerasan tablet
N		30
Normal Parameters[a,,b]	Mean	6.843
	Std. Deviation	.7482
Most Extreme Differences	Absolute	.183
	Positive	.183
	Negative	-.106
Kolmogorov-Smirnov Z		1.005
Asymp. Sig. (2-tailed)		.265

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

uji kekerasan tablet

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	10	6.380	.4962	.1569	6.025	6.735	5.2	6.9
2	10	6.920	.7642	.2417	6.373	7.467	5.2	8.1
3	10	7.230	.7499	.2371	6.694	7.766	6.3	8.9
Total	30	6.843	.7482	.1366	6.564	7.123	5.2	8.9

Test of Homogeneity of Variances

uji kekerasan tablet

Levene Statistic	df1	df2	Sig.
.270	2	27	.766

ANOVA

uji kekerasan tablet

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.701	2	1.850	3.986	.030
Within Groups	12.533	27	.464		
Total	16.234	29			

Post Hoc Tests

Multiple Comparisons

uji kekerasan tablet

LSD

(I) formula	(J) formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-.5400	.3047	.088	-1.165	.085
	3	-.8500*	.3047	.010	-1.475	-.225
2	1	.5400	.3047	.088	-.085	1.165
	3	-.3100	.3047	.318	-.935	.315
3	1	.8500*	.3047	.010	.225	1.475
	2	.3100	.3047	.318	-.315	.935

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

Uji Kerapuhan

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
ujikerapuhantablet	9	.1311	.03723	.07	.20

One-Sample Kolmogorov-Smirnov Test

		ujikerapuhantablet
N		9
Normal Parameters[a,,b]	Mean	.1311
	Std. Deviation	.03723
Most Extreme Differences	Absolute	.195
	Positive	.195
	Negative	-.160
Kolmogorov-Smirnov Z		.585
Asymp. Sig. (2-tailed)		.884

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

Uji kerapuhan tablet

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	.1600	.03606	.02082	.0704	.2496	.13	.20
2	3	.1400	.01000	.00577	.1152	.1648	.13	.15
3	3	.0933	.02517	.01453	.0308	.1558	.07	.12
Total	9	.1311	.03723	.01241	.1025	.1597	.07	.20

Test of Homogeneity of Variances

Uji kerapuhan tablet

Levene Statistic	df1	df2	Sig.
2.122	2	6	.201

ANOVA

Uji kerapuhan tablet

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.007	2	.004	5.180	.049
Within Groups	.004	6	.001		
Total	.011	8			

Post Hoc Tests

Multiple Comparisons

Uji kerapuhan tablet

LSD

(I) formula	(J) formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.02000	.02126	.383	-.0320	.0720
	3	.06667*	.02126	.020	.0147	.1187
2	1	-.02000	.02126	.383	-.0720	.0320
	3	.04667	.02126	.071	-.0053	.0987
3	1	-.06667*	.02126	.020	-.1187	-.0147
	2	-.04667	.02126	.071	-.0987	.0053

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

Uji waktu hancur

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
uji waktu hancur	18	299.61	37.506	232	352

One-Sample Kolmogorov-Smirnov Test

		uji waktu hancur
N		18
Normal Parameters[a,,b]	Mean	299.61
	Std. Deviation	37.506
Most Extreme Differences	Absolute	.203
	Positive	.129
	Negative	-.203
Kolmogorov-Smirnov Z		.860
Asymp. Sig. (2-tailed)		.451

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

uji waktu hancur

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	6	253.33	18.228	7.442	234.20	272.46	232	280
2	6	311.17	6.274	2.561	304.58	317.75	303	321
3	6	334.33	15.306	6.249	318.27	350.40	309	352
Total	18	299.61	37.506	8.840	280.96	318.26	232	352

Test of Homogeneity of Variances

uji waktu hancur

Levene Statistic	df1	df2	Sig.
2.799	2	15	.093

ANOVA

uji waktu hancur

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	20884.778	2	10442.389	51.704	.000
Within Groups	3029.500	15	201.967		
Total	23914.278	17			

Post Hoc Tests

Multiple Comparisons

uji waktu hancur

LSD

(I) formula	(J) formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-57.833*	8.205	.000	-75.32	-40.34
	3	-81.000*	8.205	.000	-98.49	-63.51
2	1	57.833*	8.205	.000	40.34	75.32
	3	-23.167*	8.205	.013	-40.66	-5.68
3	1	81.000*	8.205	.000	63.51	98.49
	2	23.167*	8.205	.013	5.68	40.66

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