

Tabel 05: Hasil pengukuran pH

Jenis Fermentasi	pH awal	pH akhir
Fermentasi koji	6,5	6
Moromi	7	5,5

Tabel 06: Jumlah pembentukan spora/g bahan

Lama fermentasi (hari)	jenis inokulum		Campuran keduanya
	<i>A. oryzae</i>	<i>R. oligosporus</i>	
0	-	-	-
1	-	-	-
2	$5 \cdot 10^2$	-	$2 \cdot 10^3$
3	$3 \cdot 10^3$	$1 \cdot 10^3$	$3 \cdot 10^3$
4	$2 \cdot 10^4$	$2 \cdot 10^3$	$3 \cdot 10^4$
5	$4 \cdot 10^5$	$2 \cdot 10^5$	$6 \cdot 10^5$

## Lampiran 02:

## A. Kadar lesitin kecap

## Data absorbansi larutan standar

Konsentrasi larutan standar (mg/100ml) X	Absorbansi (600nm) Y
0,1	0,01
0,2	0,03
0,3	0,03
0,4	0,04
0,5	0,07
0,6	0,11
0,7	0,10
0,8	0,11
0,9	0,18
1,0	0,20

$$X = 5,5 \quad Y = 0,88 \quad XY = 0,653$$

$$X^2 = 3,85 \quad Y^2 = 0,115 \quad n = 10$$

Keterangan: X = konsentrasi larutan standar

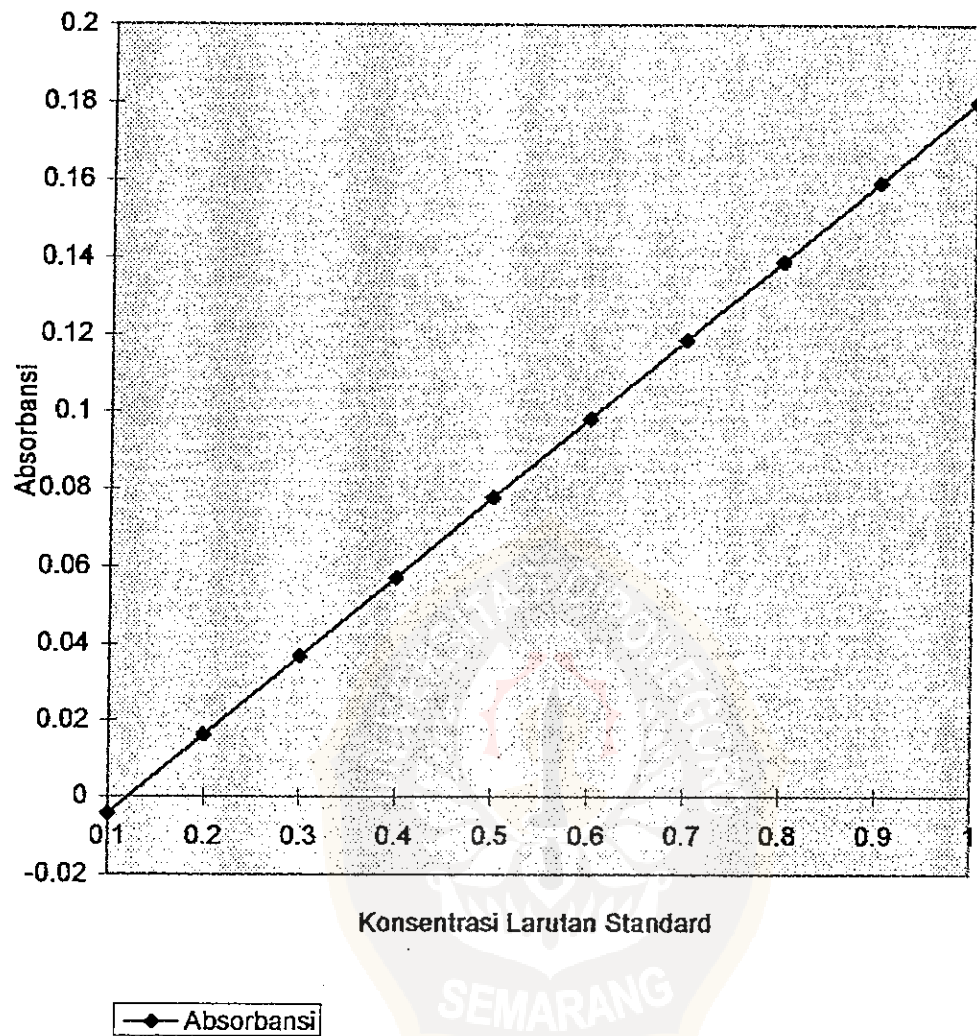
Y = absorbansi larutan standar

$$a = \frac{(\sum Y) (\sum X^2) - (\sum X)(\sum XY)}{n \cdot \sum X^2 - (\sum X)^2} = -0,0247$$

$$b = \frac{n \cdot \sum XY - (\sum X) (\sum Y)}{n \cdot \sum X^2 - (\sum X)^2} = 0,2048$$

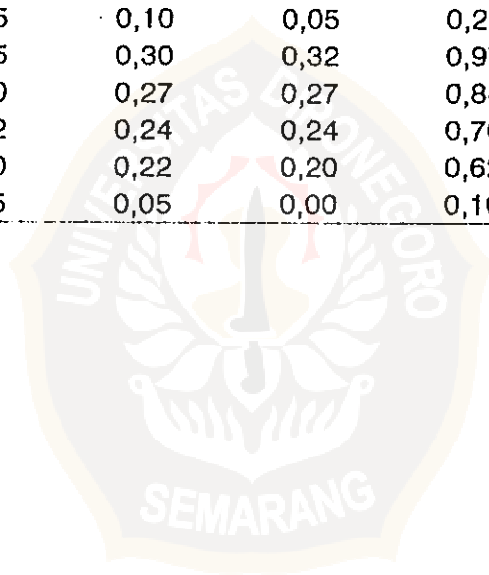
Persamaan garis kurva standar  $Y = -0,0247 + 0,2048X$

Grafik 04. Kurva Standard



**Data absorbansi kadar lesitin kecap**

Perlakuan	Absorbansi (600 nm)			Total
	Ulangan			
	1	2	3	
K A-0	0,10	0,10	0,10	0,30
K A-2	0,30	0,30	0,28	0,88
K A-3	0,24	0,24	0,26	0,74
K A-4	0,21	0,22	0,21	0,64
K A-5	0,18	0,18	0,20	0,56
K R-0	0,05	0,10	0,05	0,20
K R-2	0,25	0,23	0,25	0,73
K R-3	0,22	0,23	0,23	0,68
K R-4	0,22	0,22	0,21	0,65
K R-5	0,20	0,21	0,21	0,62
K AR-0	0,05	0,10	0,05	0,20
K AR-2	0,35	0,30	0,32	0,97
K AR-3	0,30	0,27	0,27	0,84
K AR-4	0,22	0,24	0,24	0,70
K AR-5	0,20	0,22	0,20	0,62
Kontrol	0,05	0,05	0,00	0,10

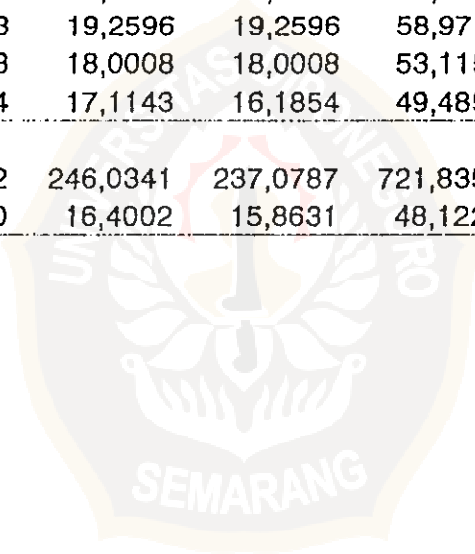


## Data kadar lesitin kecap

Perlakuan	Kadar lesitin dalam % Ulangan			Total	Rerata
	1	2	3		
K A-0	0,0333	0,0333	0,0333	0,0999	0,0333
K A-2	0,1221	0,1221	0,1133	0,3575	0,1192
K A-3	0,0955	0,0955	0,1044	0,2954	0,0985
K A-4	0,0822	0,0866	0,0822	0,2510	0,0837
K A-5	0,0688	0,0688	0,0777	0,2153	0,0718
K R-0	0,0111	0,0333	0,0111	0,0555	0,0185
K R-2	0,0999	0,0910	0,0999	0,2908	0,0969
K R-3	0,0866	0,0910	0,0910	0,2686	0,0895
K R-4	0,0866	0,0866	0,0822	0,2554	0,0851
K R-5	0,0777	0,0822	0,0822	0,2421	0,0807
K AR-0	0,0111	0,0333	0,0111	0,0555	0,0185
K AR-2	0,1444	0,1221	0,1310	0,3975	0,1325
K AR-3	0,1221	0,1088	0,1088	0,3397	0,1132
K AR-4	0,0866	0,0955	0,0955	0,2776	0,0925
K AR-5	0,0777	0,0866	0,0777	0,2420	0,0807
Total	1,2057	1,2367	1,2014	3,6438	1,2146
Rerata	0,0804	0,0824	0,0801	0,2429	0,0810

## Data hasil transformasi arc sin

Perlakuan	Ulangan			Total	Rerata
	1	2	3		
K A-0	10,5144	10,5144	10,5144	31,5432	10,5144
K A-2	20,4523	20,4523	19,6699	60,5745	20,1915
K A-3	18,0008	18,0008	18,8511	54,8527	18,2843
K A-4	16,6608	17,1143	16,6608	50,4359	16,8120
K A-5	15,2064	15,2064	16,1854	46,5982	15,5328
K R-0	6,0477	10,5144	6,0477	22,6098	7,5366
K R-2	18,4254	17,5575	17,5575	54,4083	18,1361
K R-3	17,1143	17,5575	17,5575	52,2292	17,4097
K R-4	17,1143	17,1143	16,6608	50,8894	16,9631
K R-5	16,1854	16,6608	16,6608	49,5070	16,5023
K AR-0	6,0477	10,5144	6,0477	22,6098	7,5366
K AR-2	22,3337	20,4523	21,2193	64,0053	21,3351
K AR-3	20,4523	19,2596	19,2596	58,9715	19,6572
K AR-4	17,1143	18,0008	18,0008	53,1159	17,7053
K AR-5	16,1854	17,1143	16,1854	49,4851	16,4950
<b>Total</b>	<b>237,8552</b>	<b>246,0341</b>	<b>237,0787</b>	<b>721,8358</b>	<b>240,6930</b>
<b>Rerata</b>	<b>15,8570</b>	<b>16,4002</b>	<b>15,8631</b>	<b>48,1224</b>	<b>16,0408</b>



### Analisis statistik

$$FK = \frac{721,8360^2}{45} = 11578,8269$$

$$JK_{\text{total}} = 782,1554$$

$$JK_{\text{inokulum}} = 12,6103$$

$$JK_{\text{fermentasi}} = 705,0586$$

$$JK_{\text{interaksi}} = 31,4606$$

$$JKE = 33,0259$$

Sumber	db	JK	KT	F <sub>Hitung</sub>	F <sub>Tabel</sub>	
					5%	1%
Keragaman					5%	1%
Perlakuan	14					
Inokulum	2	12,6103	6,3052	5,7273**	3,22	5,39
Fermentasi	4	705,0586	176,2647	160,1096**	2,69	4,02
Interaksi	8	31,4606	3,9326	3,5722**	2,27	3,17
Error	30	33,0259	1,1009			
Total	44	782,1554				

Keterangan : \*\* = sangat berbeda nyata

$$KK = \frac{\sqrt{KTE}}{Y} \times 100\% = 6,5411\%$$

## Uji BNT

$$S_d = \frac{\sqrt{2 \times KTE}}{\sqrt{r}} = 0,856$$

$$t_{0,05(30)} = 2,042$$

$$BNT_{0,05} = 2,042 \times 0,8$$

$$BNT_{0,01} = 2,750 \times 0,8$$

## Hasil Uji BNT

Perlakuan	K AR-2		KA-0	KAR-0	KR-0
	Rerata	21.3351	10.5144	7.5366	7.5366
K R-0	7.5366	13.7985 ** *	2.9778 **	0	0
K AR-0	7.5366	13.7985 ** *	2.9778 **	0	
K A-0	10.5144	10.8207 ** *	0		
K A-5	15.5328	5.8023 **			
K AR-5	16.4950	4.8401 **			
K R-5	16.5023	4.8328 **			
K A-4	16.8120	4.5231 **			
K R-4	16.9631	4.3720 **			
K R-3	17.4097	3.9254 **			
K AR-4	17.7053	3.6298 **			
K R-2	18.1361	3.1990 **			
K A-3	18.4843	2.8508 **			
K AR-3	19.6572	1.6779			
K A-2	20.1915	1.1435			
K AR-2	21.3351	0			

Keterangan : \* = p < 0,05  
 \*\* = p < 0,01





## Lampiran 03:

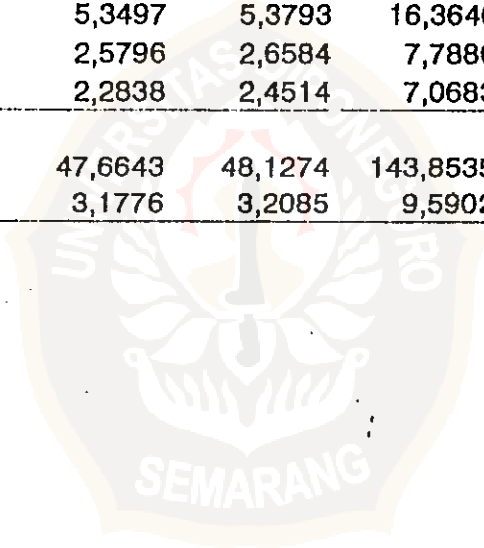
## B. Kadar asam lemak bebas.

Data pemakaian NaOH pada titrasi

Perlakuan	Jumlah NaOH dalam ml			Total
	1	2	3	
K A-0	5,8	4,9	5,3	16,0
K A-2	62,8	62,1	63,7	188,6
K A-3	58,9	57,9	58,0	174,8
K A-4	27,7	26,8	26,9	81,4
K A-5	22,6	24,3	24,4	71,3
K R-0	4,9	5,1	5,1	15,1
K R-2	42,8	43,0	43,2	129,0
K R-3	52,2	51,6	50,8	154,6
K R-4	32,1	30,2	30,4	92,7
K R-5	23,9	25,0	24,3	73,2
K AR-0	5,8	5,2	5,2	16,2
K AR-2	66,3	67,7	67,9	201,9
K AR-3	59,2	56,3	56,6	172,1
K AR-4	27,9	28,2	29,0	85,1
K AR-5	25,2	25,7	26,9	77,8
Kontrol	2,1	1,9	2,1	6,1

## Data kadar asam lemak bebas dalam %

Perlakuan	Kadar asam lemak bebas			Total	Rerata
	1	2	3		
K A-0	0,3713	0,2826	0,3220	0,9759	0,3253
K A-2	5,9905	5,9215	6,0791	17,9911	5,997
K A-3	5,6060	5,5074	5,6159	16,7293	5,5764
K A-4	2,5303	2,4415	2,4514	7,4232	2,4744
K A-5	2,0275	2,1951	2,2049	6,4275	2,1425
K R-0	0,2826	0,3023	0,3023	0,8872	0,2954
K R-2	4,0188	4,0386	4,0583	12,1157	4,0386
K R-3	4,9455	4,8864	4,8075	14,6394	4,8798
K R-4	2,9574	2,7767	2,7964	8,5305	2,8435
K R-5	2,1557	2,2641	2,1951	6,6149	2,205
K AR-0	0,3713	0,3122	0,3122	0,9957	0,3319
K AR-2	6,3355	6,4735	6,4932	19,3022	6,4341
K AR-3	5,6356	5,3497	5,3793	16,3646	5,4549
K AR-4	2,5500	2,5796	2,6584	7,7880	2,596
K AR-5	2,2838	2,2838	2,4514	7,0683	2,3561
Total	48,0618	47,6643	48,1274	143,8535	47,9509
Rerata	3,2041	3,1776	3,2085	9,5902	3,1967



### Analisis statistik

$$FK = 459,8629$$

$$JK_{\text{total}} = 184,0807$$

$$JK_{\text{inokulum}} = 2,7957$$

$$JK_{\text{fermentasi}} = 173,0258$$

$$JK_{\text{interaksi}} = 8,0870$$

$$JKE = 0,1722$$

Sumber	db	JK	KT	F <sub>Hitung</sub>	F <sub>Tabel</sub>	
					5%	1%
Keragaman					5%	1%
Perlakuan	14					
Inokulum	2	2,7959	1,3979	245,2456**	3,22	5,39
Fermentasi	4	173,0258	43,2565	7588,8596**	2,69	4,02
Interaksi	8	8,0870	1,0109	177,3509**	2,27	3,17
Error	30	0,1722	0,0057			
Total	44	184,0807				

Keterangan : \*\* = sangat berbeda nyata

$$KK = 2,3618 \cdot 10^{-2} \times 100\% = 2,3618\%$$

Uji BNJ (Beda Nyata Ju

$$Q_{0,05}(15,30) = 5,21$$

$$S_y = \frac{\sqrt{KPE}}{\sqrt{r}} = 0,0436$$

$$W_{0,05} = 5,21 \times 0,0436$$

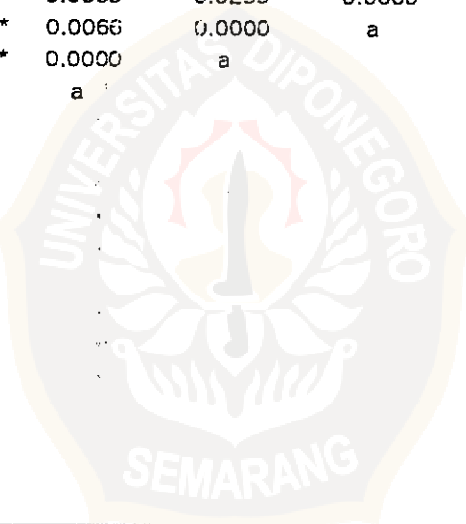
$$W_{0,01} = 6,14 \times 0,0436$$

### Hasil uji BNJ

Perlakuan	Rerata	KAR-2	K	KAR-0	KA-0	KR-0
K R-0	0.2954	6.1387 **	5*	0.0365	0.0299	0.0000
k A_)	0.3253	6.1088 **	5*	0.0066	0.0000	a
K AR-0	0.3319	6.1022 **	5*	0.0000	a	
K A-5	2.1425	4.2916 **	3	a		
K R-5	2.2050	4.2291 **	3			
K AR-5	2.3561	4.0780 **	3			
K A-4	2.4744	3.9597 **	3			
K AR-4	2.5960	3.8381 **	3			
K R-4	2.8435	3.5906 **	3			
K R-2	4.0386	2.3955 **	1			
K R-3	4.6798	1.5543 **	1			
K AR-3	5.4549	0.9792 **	C			
K A-3	5.5764	0.8577 **	C			
K A-2	5.9970	0.4371 **	C			
K AR-2	6.4341	0.0000				

Keterangan : \* = ber

\*\* = sar



## Lampiran 05:

## C. Angka Asam

Data hasil pengukuran angka asam

Perlakuan	Angka asam dalam % Ulangan			Total	Rerata
	1	2	3		
K A-0	0,5343	0,4067	0,4634	1,4044	0,4681
K A-2	8,6203	8,5210	8,7478	25,8891	8,6297
K A-3	8,6203	7,9251	8,0813	24,0734	8,0245
K A-4	3,6411	3,5133	3,1729	10,6820	3,5607
K A-5	2,9176	3,1587	3,1729	9,2492	3,0831
K R-0	0,4067	0,4350	0,4350	1,2767	0,4256
K R-2	5,7831	5,8115	5,8399	17,4345	5,8115
K R-3	7,1166	7,0315	6,9180	21,0661	7,022
K R-4	4,2557	3,9957	4,0240	12,2754	4,0918
K R-5	3,1021	3,2580	3,1587	9,3437	3,1729
K AR-0	0,5343	0,4493	0,4493	1,4329	0,4776
K AR-2	9,1168	9,3154	9,3437	27,7759	9,2586
K AR-3	8,1096	7,6982	7,7408	23,5486	7,8495
K AR-4	3,6695	3,7120	3,8254	11,2069	3,7356
K AR-5	3,2864	3,3357	3,5276	10,1713	3,3904
Total	66,0590	68,5887	72,3575	207,0052	69,0017
Rerata	4,4039	4,5726	4,8238	13,8003	4,6001

### Analisa statistik

$$FK = 952,2478$$

$$JK_{total} = 381,1770$$

$$JK_{inokulum} = 5,7893$$

$$JK_{fermentasi} = 358,2857$$

$$JK_{interaksi} = 16,7455$$

$$JKE = 0,3565$$

### Anova

Sumber	db	JK	KT	F <sub>hitung</sub>	F <sub>Tabel</sub>	
					5%	1%
Keragaman						
Perlakuan	14					
Inokulum	2	5,7893	2,8947	243,2521**	3,22	5,39
Fermentasi	4	358,2857	89,5714	7527,0084**	2,69	4,02
Interaksi	8	16,7455	2,0932	175,8992**	2,27	3,17
Error	30	0,3565	0,0119			
Total	44	381,1770				

Keterangan : \*\* = sangat berbeda nyata

$$KK = 2,3717 \cdot 10^{-2} \times 100\% = 2,3717\%$$

Uji BNJ (Beda Nyata J)

$$Q_{0,05}(15,30) = 5,21$$

$$s_y = \frac{\sqrt{KTE}}{\sqrt{r}} = 0,0630$$

$$W_{0,05} = 5,21 \times 0,0630$$

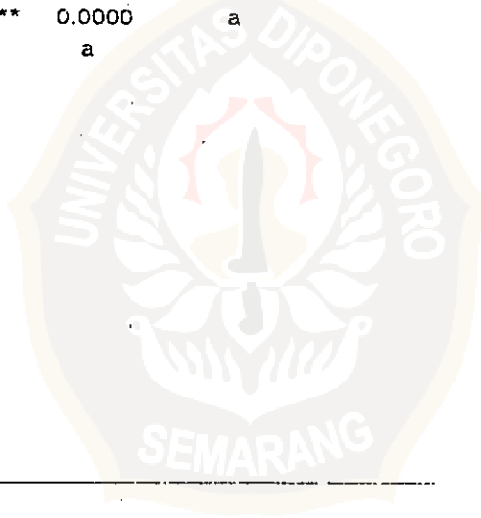
$$W_{0,01} = 6,14 \times 0,0630$$

### Hasil Uji BNJ

Perlakuan	K AR-2			K AR-0	K A-0	K R-0
	Rerata	9.2586		0.4776	0.4681	0.4256
K R-0	0.4256	8.8330 **	**	0.0520	0.0425	0.0000
K A-0	0.4681	8.7905 **	**	0.0095	0.0000	a
K AR-0	0.4776	8.7810 **	**	0.0000	a	a
K A-5	3.0381	6.2205 **		a		
K R-5	3.1729	6.0857 **				
K AR-5	3.3904	5.8682 **				
K A-4	3.5607	5.6979 **				
K AR-4	3.7356	5.5230 **				
K R-4	4.0918	5.1668 **				
K R-2	5.8115	3.4471 **				
K R-3	7.0220	2.2366 **				
K AR-3	7.8495	1.4091 **				
K A-3	8.0245	1.2341 **				
K A-2	8.6294	0.6292 **				
K AR-2	9.2586	0.0000				
		k				

Keterangan : \* = b

\*\* = s



## Lampiran 06:

## Analisis Regresi

X	Y
0	10,5144
0	7,5366
0	7,5366
2	20,1915
2	18,1361
2	21,3551
3	18,2843
3	17,4097
3	19,6572
4	16,8120
4	16,9631
4	17,7053
5	15,5328
5	16,5023
5	16,4950

$$n = 15$$

$$\Sigma X = 42 \quad \Sigma X^2 = 162 \quad \Sigma X^3 = 672 \quad \Sigma X^4 = 2934$$

$$\Sigma Y = 240,6120 \quad \Sigma XY = 733,9511 \quad \Sigma X^2Y = 2773,7505$$

Persamaan regresi :

$$Y = 12,7693 + 5,4128X - 1,1004X^2$$

Koefisien korelasi

$$R = 0,7307$$



## Anova

Sumber	db	JK	KT	F <sub>hitung</sub>	F <sub>Tabel</sub>	
Keragaman					5%	1%
Regresi	2	133,3332	66,6666	6,8742*	3,89	6,93
Sisa	12	116,3777	9,6981			
Total	14	249,7109				



### Grafik Analisis Regresi

