LAMPIRAN

Lampiran 01. Perhitungan statistik diameter tubulus seminiferus

Tabel 03. Rata-rata diameter tubulus seminiferus (µm)

DOSIS (Mg)	ULANGAN						Σ	Rataan
	1	2	3	4	5	6		
0	151,40	159,50	163,53	160,53	161,33	155,47	951,78	158,63
14	154,37	177,65	162,62	168,12	165,92	168,25	996,96	166,16
28	177,83	169,77	165,73	165,17	176,73	177,60	1032,84	172,14
56	176,37	182,60	183,70	186,27	187,00	185,53	1101,48	183,58
Σ							4083,06	680,51

Uji Homogenitas (Uji Bartlett)

$$JK_{P0} = [(151,40)^2 + \ldots\ldots + (155,47)^2] - \frac{(951,78)^2}{6} = 91,58$$

$$JK_{P1} = [(154,37)^2 + \ldots\ldots + (177,60)^2] - \frac{(996,96)^2}{6} = 281,86$$

$$JK_{P2} = [(177,83)^2 + \ldots\ldots + (157,45)^2] - \frac{(1032,84)^2}{6} = 175,10$$

$$JK_{P3} = [(176,37)^2 + \ldots\ldots + (185,53)^2] - \frac{(1101,48)^2}{6} = 72,03$$

$$S_{P0} = \frac{JK_{P0}}{db_{P0}} = \frac{91,58}{5} = 18,32 \rightarrow \log S_{P0} = 0,17$$

$$S_{P1} = \frac{JK_{P1}}{db_{P1}} = \frac{281,86}{5} = 56,37 \rightarrow \log S_{P1} = 1,75$$

$$S_{P2} = \frac{JK_{P2}}{db_{P2}} = \frac{175,1}{5} = 35,02 \rightarrow \log S_{P2} = 1,54$$

$$S_{P3} = \frac{JK_{P3}}{db_{P3}} = \frac{70,03}{5} = 14,41 \rightarrow \log S_{P2} = 1,16$$

Tabel 04. Uji Bartlett diameter tubulus seminiferus

Perlakuan	db	1/db	JK	Si	Log Si	db Log Si
P0	5	0,2	91,58	18,32	0,17	0,85
P1	5	0,2	281,86	56,37	1,75	8,75
P2	5	0,2	175,10	35,02	1,54	7,70
P3	5	0,2	72,03	14,41	1,16	5,80
Total	20	0,8	620,57			23,10

$S^2 = \frac{\text{total JK}}{\text{total db}} = \frac{620,57}{20} = 31,03 \longrightarrow \log S^2 = 1,49$

$X^2 = 2,3026 \quad [(20)(1,49) - (2,31)] = 15,43$

Faktor koreksi $C = 1 + \frac{1}{3(4-1)} \quad [(0,8 - {}^{1}/_{20})] = 1,0833$

X^2 (*terkoreksi*) = (1/1,0833) (15,43) = 14,24

X^2 (tabel) $\longrightarrow X^2 (0,05 : 12) = 21,00$

Kesimpulan X^2 (*terkoreksi*) < X^2 (tabel), maka data **homogen.**

Uji Normalitas

Tabel 05. Data Normalitas diameter tubulus seminiferus

Xi	F.K	Fn (Xi)	Z	Fo(Xi)	|Fn(Xi) - Fo(Xi)|	|Fn(Xi-1) – Fo(Xi)|
151,40	1	0,0417	-1,7643	0,0405	0,0012	0,0405
154,37	2	0,0833	-1,4692	0,0708	1,0125	0,0291
155,47	3	0,1250	-1,3666	0,0861	0,0389	0,0028
159,50	4	0,1667	-0,9907	0,1611	0,0056	0,0361
160,53	5	0,2083	-0,8946	0,1867	0,0216	0,0200
161,33	6	0,2500	-0,8199	0,2076	0,0424	0,0007
162,62	7	0,2917	-0,6996	0,2451	0,0466	0,0049
163,53	8	0,3333	-0,6147	0,2709	0,0624	0,0208
165,17	9	0,3750	-0,4618	0,3228	0,0522	0,0105
165,73	10	0,4167	-0,4095	0,3428	0,0739	0,0322
165,92	11	0,4583	-0,3918	0,3483	0,1100	0,0684
168,12	12	0,5000	-0,1866	0,4267	0,0733	0,0316
168,25	13	0,5417	-0,1744	0,4325	0,1092	0,0675
169,77	14	0,5833	-0,0326	0,4880	0,0953	0,0537
176,37	15	0,6250	0,5830	0,7190	0,0940	0,1357
176,73	16	0,6667	0,6166	0,7308	0,0641	0,1058
177,60	17	0,7083	0,6978	0,7549	0,0466	0,0882
177,65	18	0,7500	0,7024	0,7580	0,0008	0,0497
177,83	19	0,7917	0,7192	0,7672	0,0290	0,0127
182,60	20	0,8333	1,1642	0,8770	0,0437	0,0853
183,70	21	0,8750	1,2668	0,8971	0,0221	0,0638
185,53	22	0,9167	1,4375	0,9244	0,0077	0,0494
186,27	23	0,9583	1,5065	0,9339	0,0244	0,0172
187,00	24	1,0000	1,5746	0,9418	0,0582	0,0165

$\bar{X} = 170,12$

$S = 10,72$

D(*hitung*) = 0,1357

D(*tabel*) $\rightarrow$(0,05 :24) = 0,242

Kesimpulan : D*(hitung)* < D(*tabel*), maka data **terdistribusi normal.**

Standar deviasi (s)

$$s = \sqrt{\frac{\Sigma(x_i - x)}{n-1}}$$

$$= \sqrt{\frac{\{(151,4 - 170,12)^2 + \ldots + (185,53 - 170,12)^2\}}{23}}$$

$$= 10,72$$

Perhitungan Anova

$$\mathbf{FK} = \frac{(\Sigma\Sigma Y_{ij})^2}{n} = \frac{(4083,06)^2}{24} = 694640,79$$

$$\sum_{i=1} n_i$$

$$\mathbf{JKT} = \Sigma\Sigma (Y_{ij})^2 - FK = \{(151,40)^2 + (159,50)^2 + \ldots + (185,53)^2\} - FK$$
$$= 697259,04 - 694640,79$$
$$= 2618,25$$

$$\mathbf{JKP} = \Sigma_i (\Sigma_j Y_{ij})^2 - FK$$

$$= \frac{\{(951,78)^2 + (996,96)^2 + (1032,84)^2 + (1101,48)^2\}}{6} - FK$$

$$= 696638,51 - 694640,79$$
$$= 1997,72$$

$$\mathbf{JKG} = JKT - JKP = 2618,25 - 1997,72 = 620,53$$

$$\mathbf{KTP} = JKP / db\ P = 1997,72 / 3 = 665,91$$

$$\mathbf{KTG} = JKG / dbG = 620,53 / 20 = 31,03$$

$$\mathbf{Fhit} = KTP / KTG = 665,91 / 31,03 = 21,46$$

Tabel 06. ANOVA Data diameter tubulus seminiferus

Sumber Variansi	db	JK	KT	F hitung	F Tabel 5 % 1 %
Perlakuan	3	1997,72	665,91	21,46**	3,10 4,94
Galat	20	620,53	31,03		
Total	23	2618,25			

**= signifikan

$$CV = \frac{\sqrt{KTG}}{\hat{y}} \times 100\% = \frac{\sqrt{31,03}}{170,12} \times 100\% = 0,82\%$$

Hasil Uji F :

- Pemberian Pasak bumi berpengaruh sangat nyata dalam meningkatkan diameter tubulus seminiferus (F Hit > F Tabel)
- Percobaan mempunyai derajat kejituan yang tinggi dengan CV= 0,82 %, maka itu di gunakan uji lanjut Beda nyata jujur (BNJ).

UJI BNJ

Statistik ujinya :

$$W\alpha = q(dbG; p)\ \sqrt{\frac{KTG}{n}}$$

Dimana :
- q = Nilai tabel q
- dbG = Derajat bebas galat
- KTG = Kuadrat tengah galat
- n = Jumlah ulangan

Hipotesis :
- Ho = berbeda nyata
- H1= tidak berbeda nyata

Kaidah pengujian :

$(\hat{Y}_1 - \hat{Y}_2) \geq W\alpha$ = H1 diterima

$(\hat{Y}_1 - \hat{Y}_2) \leq W\alpha$ = H1 ditolak

dbG = 20, P = 4

α	q
1%	5,02
5%	3,96

Maka : w 1% = 11,42
w 5% = 8,99

Diagram beda rata-rata diameter tubulus seminiferus

Rata-rata	Beda dengan		
	T0	T1	T2
T0 158,63			
T1 166,16	7,35		
T2 172 14	13,51**	5,98	
T3 183,58	24,95**	17,42*	11,44*

Lampiran 02. Perhitungan statistik tebal epitel tubulus seminiferus

Tabel 07. Data rata-rata tebal epitel tubulus seminiferus (μm)

DOSIS (Mg)	ULANGAN						∑	Rataan
	1	2	3	4	5	6		
0	49,05	49,87	53,37	47,27	54,63	49,87	304,50	50,75
14	43,82	52,71	46,46	48,68	45,75	47,83	285,25	47,54
28	51,88	47,85	44,92	45,92	50,78	49,59	290,74	48,46
56	46,94	50,05	48,95	49,32	50,79	47,85	293,90	49,98
∑							1174,39	196,73

Uji Homogenitas (Uji Bartlett)

$$JK_{P0} = [(49,05)^2 + \ldots\ldots + (49,87)^2] - \frac{(304,50)^2}{6} = 38,16$$

$$JK_{P1} = [(43,82)^2 + \ldots\ldots + (47,83)^2] - \frac{(285,25)^2}{6} = 46,31$$

$$JK_{P2} = [(51,88)^2 + \ldots\ldots + (59,49)^2] - \frac{(290,74)^2}{6} = 37,30$$

$$JK_{P3} = [(46,94)^2 + \ldots\ldots + (47,85)^2] - \frac{(293,90)^2}{6} = 9,96$$

$$S_{P0} = \frac{JK_{P0}}{db_{P0}} = \frac{38,16}{5} = 7,65 \rightarrow \log S_{P0} = 0,88$$

$$S_{P1} = \frac{JK_{P1}}{db_{P1}} = \frac{46,31}{5} = 9,26 \rightarrow \log S_{P1} = 0,97$$

$$S_{P2} = \frac{JK_{P2}}{db_{P2}} = \frac{37,30}{5} = 7,46 \rightarrow \log S_{P2} = 0,87$$

$$S_{P3} = \frac{JK_{P3}}{db_{P3}} = \frac{70,03}{5} = 1,99 \rightarrow \log S_{P2} = 0,29$$

Tabel 08. Uji Bartlett tebal epitel tubulus seminiferus

Perlakuan	db	1/db	JK	Si	Log Si	db Log Si
P0	5	0,2	38,16	7,63	0,88	4,40
P1	5	0,2	46,31	9,26	0,97	4,85
P2	5	0,2	37,30	7,46	0,87	4,35
P3	5	0,2	9,96	1,99	0,29	1,49
Total	20	0,8	131,73			15,09

$$S^2 = \frac{\text{total JK}}{\text{total db}} = \frac{131,73}{20} = 6,59 \longrightarrow \log S^2 = 0,82$$

$X^2 = 2,3026 \quad [(20)(0,82) - (15,09)] = 3,01$

Faktor koreksi $C = 1 + \frac{1}{3(4-1)} \quad [(0,8 - {}^{1}/_{20})] = 1,0833$

X^2 (*terkoreksi*) $= (1/1,0833)\,(3,01) = 2,78$

X^2 (tabel) $\rightarrow X^2(0,05 : 12) = 21,00$

Kesimpulan X^2 (*terkoreksi*) $< X^2$ (tabel), maka data **homogen.**

Standar deviasi (s)

$$s = \sqrt{\frac{\Sigma(x_i - x)}{n-1}}$$

$$= \sqrt{\frac{\{(49,05 - 48,92)^2 + \ldots + (47,85 - 48,92)^2\}}{23}}$$

$$= 2,74$$

Uji Normalitas

Tabel 09. Data normalitas tebal epitel tubulus seminiferus

Xi	F.K	Fn (Xi)	Z	Fo(Xi)	Fn(Xi) - Fo(Xi)	Fn(Xi-1) – Fo(Xi)
43,82	1	0,0417	-1,8613	0,0314	0,0103	0,0103
44,92	2	0,0833	-1,4599	0,0729	0,0104	0,0312
45,75	3	0,1250	-1,1569	0,1241	0,0009	0,0408
45,92	4	0,1667	-1,0949	0,1379	0,0288	0,0129
46,46	5	0,2083	-0,8979	0,1867	0,0216	0,0200
46,94	6	0,2500	-0,7226	0,2358	0,0142	0,0275
47,27	7	0,2917	-0,6022	0,2743	0,0174	0,0243
47,83	8	0,3333	-0,3978	0,3483	0,0150	0,0566
47,85	10	0,4167	-0,3905	0,3483	0,0684	0,0150
48,68	11	0,4583	-0,0876	0,4661	0,0078	0,0494
48,95	12	0,5000	0,0109	0,5040	0,0040	0,0457
49,05	13	0,5417	0,0474	0,5179	0,0238	0,0179
49,32	14	0,5833	0,1459	0,5577	0,0256	0,0160
49,59	15	0,6250	0,2445	0,5948	0.0302	0,0115
49,87	17	0,7083	0,3467	0,6349	0,0734	0,0099
50,05	18	0,7500	0,4124	0,6591	0.0909	0,0492
50,78	19	0,7917	0,6788	0,7502	0,0415	0,0002
50,79	20	0,8333	0,6825	0,7517	0,0819	0,0400
51,88	21	0,8750	1,0803	0,8599	0,0151	0,0266
52,71	22	0,9167	1,3832	0,9167	0,0005	0,0412
53,37	23	0,9583	1,6241	0,9474	0,0109	0,0307
54,63	24	1,0000	2,0839	0,9812	0,0188	0,0229

$\overline{X} = 48,92$

$S = 2,74$

$D(hitung) = 0,0566$

$D(tabel) \rightarrow (0,05 : 24) = 0,242$

Kesimpulan : $D(hitung) < D(tabel)$, maka data **terdistribusi normal.**

Perhitungan Anova

$$\mathbf{FK} = \frac{(\Sigma\Sigma\, Y_{ij})^2}{\sum_{i=1}^{n} ni} = \frac{(1174,39)^2}{24} = 57466,33$$

$$\mathbf{JKT} = \Sigma\Sigma\,(Y_{ij})^2 - FK = \left\{(49,50)^2 + (49,87)^2 + \ldots + (47,85)^2\right\} - FK$$
$$= 57630,86 - 57466,33 = 164,53$$

$$\mathbf{JKP} = \Sigma_i (\Sigma_j Y_{ij})^2 - FK$$

$$= \frac{\{(304,50)^2 + (285,25)^2 + (290,74)^2 + (293,90)^2\}}{6} - FK$$

$$= 57499,13 - 57466,33$$

$$= 32,79$$

$$\mathbf{JKG} = JKT - JKP = 164,53 - 32,79 = 131,74$$

$$\mathbf{KTP} = JKP / db\ P = 32,79 / 3 = 10,93$$

$$\mathbf{KTG} = JKG / dbG = 131,74 / 20 = 6,59$$

$$\mathbf{Fhit} = KTP / KTG = 10,93 / 6,59 = 1,66$$

Tabel 10. Anova data tebal epithel tubulus seminiferus

Sumber Variansi	db	JK	KT	F hitung	F Tabel 5 % 1 %
Perlakuan	3	**32,79**	10,93	$1,66^{ns}$	3,10 4,94
Galat	20	131,74	6,59		
Total	23	164,53			

ns= tidak signifikan

$$\mathbf{CV} = \sqrt{\frac{KTG}{\hat{y}}} \times 100\% = \sqrt{\frac{6,59}{196,73}} \times 100\% = 1,30\ \%$$

Lampiran 03. Perhitungan statistik bobot testis

Tabel 11. Data rata-rata bobot testis (g)

DOSIS (Mg)	ULANGAN						∑	Rataan
	1	2	3	4	5	6		
0	0,10	0,19	0,14	0,14	0,13	0,17	0,87	0,15
14	0,14	0,12	0,12	0,15	0,14	0,12	0,79	0,13
28	0,16	0,13	0,12	0,13	0,10	0,17	0,81	0,14
56	0,14	0,14	0,15	0,15	0,15	0,14	0,87	0,15
∑							3,34	0,57

Uji Homogenitas (Uji Bartlett)

$$JK_{P0} = [(0,10)^2 + \ldots\ldots + (0,17)^2] - \frac{(0,87)^2}{6} = 0,00495$$

$$JK_{P1} = [(0,14)^2 + \ldots\ldots + (0,12)^2] - \frac{(0,79)^2}{6} = 0,00090$$

$$JK_{P2} = [(0,16)^2 + \ldots\ldots + (0,17)^2] - \frac{(0,81)^2}{6} = 0,00334$$

$$JK_{P3} = [(0,14)^2 + \ldots\ldots + (0,14)^2] - \frac{(0,87)^2}{6} = 0,000150$$

$$S_{P0} = \frac{JK_{P0}}{db_{P0}} = \frac{0,00495}{5} = 0,00099 \rightarrow \log S_{P0} = -3,004$$

$$S_{P1} = \frac{JK_{P1}}{db_{P1}} = \frac{0,00090}{5} = 0,00018 \rightarrow \log S_{P1} = -3,740$$

$$S_{P2} = \frac{JK_{P2}}{db_{P2}} = \frac{0,00334}{5} = 0,000668 \rightarrow \log S_{P2} = -3,18$$

$$S_{P3} = \frac{JK_{P3}}{db_{P3}} = \frac{0,000150}{5} = 0,00003 \rightarrow \log S_{P2} = -4,52$$

Tabel 12. Uji Bartlett bobot testis

Perlakuan	db	1/db	JK	Si	Log Si	db Log Si
P0	5	0,2	0,00495	0,00099	-3,004	-15,02
P1	5	0,2	0,00090	0,00018	-3,740	-18,70
P2	5	0,2	0,00334	0,00067	-3,180	-15,90
P3	5	0,2	0,00015	0,00003	-4,520	-22,60
Total	20	0,8	0,00934			-72,22

$$S^2 = \frac{\text{total JK}}{\text{total db}} = \frac{0,00934}{20} = 0,000467 \longrightarrow \log S^2 = -3,33$$

$$X^2 = 2,3026 \quad [(20)(-3,33) - (-72,22)] = 12,94$$

$$\text{Faktor koreksi } C = 1 + \frac{1}{3(4-1)} \quad [(0,8 - {}^{1}/_{20})] = 1,0833$$

X^2 (*terkoreksi*) = (1/1,0833) (12,94) = 11,95

X^2 (tabel) $\longrightarrow$ X^2 (0,05 : 12) = 21,00

Kesimpulan X^2 (*terkoreksi*) < X^2 (tabel), maka data **homogen.**

Standar deviasi (s)

$$s = \sqrt{\frac{\Sigma(x_i - x)}{n-1}}$$

$$= \sqrt{\frac{\{(0,10 - 0,14)^2 + \ldots + (0,14 - 0,14)^2\}}{23}}$$

$$= 0,02$$

Uji Normalitas

Tabel 13. Data normalitas bobot testis

Xi	F.K	Fn (Xi)	Z	Fo(Xi)	Fn(Xi) - Fo(Xi)	Fn(Xi-1) – Fo(Xi)
0,10	2	0,0833	-2,0000	0.0228	0,0605	0,0228
0,12	6	02500	-1,0000	0,1587	0,0913	0,0754
0,13	9	0,3750	-0,5000	0,3085	0,0665	0,0585
0,14	16	0,6667	0,0000	0,5000	0,1667	0,1250
0,15	20	0,8333	0,5000	0,6915	0,1418	0,0248
0,16	21	0,8750	1,0000	0,8413	0,0337	0,0080
0,17	23	0,9583	1,5000	0,9332	0,0251	0,0582
0,19	24	1,0000	2,5000	0,9938	0,0062	0,0355

X = 0,14

S = 0,02

D(*hitung*) = 0,1250

D(*tabel*) →(0,01 :24) = 0,301

Kesimpulan : D*(hitung)* < D(*tabel*), maka data **terdistribusi normal.**

Perhitungan Anova

$$\mathbf{FK} = \frac{(\Sigma\Sigma Y_{ij})^2}{\sum_{i=1}^{n} ni} = \frac{(3,34)^2}{24} = 0,465$$

$$\mathbf{JKT} = \Sigma\Sigma (Y_{ij})^2 - FK = \{(0,10)^2 + (0,19)^2 + \ldots + (0,14)^2\} - FK$$
$$= 0,479 - 0,465$$
$$= 0,014$$

$$\mathbf{JKP} = \Sigma_i (\Sigma_j Y_{ij})^2 - FK$$

$$= \frac{\left\{(0,87)^2 + (0,79)^2 + (0,81)^2 + (0,87)^2\right\}}{6} - FK$$

$$= 0,466 - 0,465$$

$$= 0,001$$

$$\mathbf{JKG} = JKT - JKP = 0,014 - 0,001 = 0,013$$

$$\mathbf{KTP} = JKP / db\,P = 0,001 / 3 = 0,0003$$

$$\mathbf{KTG} = JKG / dbG = 0,013 / 20 = 0,00065$$

$$\mathbf{Fhit} = KTP / KTG = 0,0003 / 0,00065 = 0,46$$

Tabel 14. Anova data bobot testis

Sumber Variansi	db	JK	KT	F hitung	F Tabel 5 %	F Tabel 1 %
Perlakuan	3	0,001	0,0003	$0,46^{ns}$	3,10	4,94
Galat	20	0,013	0,00065			
Total	23	0,014				

ns= non signifikan

$$\mathbf{CV} = \sqrt{\frac{KTG}{\hat{y}}} \times 100\% = \sqrt{\frac{0,00065}{0,57}} \times 100\% = 4,47\,\%$$

Lampiran 04. Perhitungan statistik bobot badan awal (g)

Tabel 05. Data rata-rata bobot badan awal

DOSIS (Mg)	ULANGAN						∑	Rataan
	1	2	3	4	5	6		
0	24,30	22,20	23,70	26,20	21,00	21,30	138,70	23,12
14	27,50	23,00	24,20	23,60	26,20	28,80	153,00	25,50
28	22,90	28,90	24,50	23,40	25,20	25,50	150,40	25,07
56	21,20	29,10	23,50	23,70	27,80	25,50	150,80	15,13
∑							592,9	98,82

Uji Homogenitas (Uji Bartlett)

$$JK_{P0} = [(24,30)^2 + \ldots\ldots + (21,30)^2] - \frac{(138,70)^2}{6} = 19,87$$

$$JK_{P1} = [(27,50)^2 + \ldots\ldots + (28,80)^2] - \frac{(153,00)^2}{6} = 42,23$$

$$JK_{P2} = [(22,90)^2 + \ldots\ldots + (25,50)^2] - \frac{(150,40)^2}{6} = 22,69$$

$$JK_{P3} = [(21,20)^2 + \ldots\ldots + (25,50)^2] - \frac{(150,80)^2}{6} = 43,17$$

$$S_{P0} = \frac{JK_{P0}}{db_{P0}} = \frac{19,87}{5} = 3,97 \rightarrow \log S_{P0} = 0,599$$

$$S_{P1} = \frac{JK_{P1}}{db_{P1}} = \frac{42,23}{5} = 8,45 \rightarrow \log S_{P1} = 0,927$$

$$S_{P2} = \frac{JK_{P2}}{db_{P2}} = \frac{22,69}{5} = 4,54 \rightarrow \log S_{P2} = 0,657$$

$$S_{P3} = \frac{JK_{P3}}{db_{P3}} = \frac{43,17}{5} = 8,63 \rightarrow \log S_{P2} = 0,936$$

Tabel 16. Uji Bartlett bobot badan awal

Perlakuan	db	1/db	JK	Si	Log Si	db Log Si
P0	5	0,2	19,87	3,974	0,599	2,995
P1	5	0,2	42,23	8,446	0,927	4,635
P2	5	0,2	22,69	4,538	0,657	3,285
P3	5	0,2	43,17	8,634	0,936	4,680
Total	20	0,8	127,96			15,595

$$S^2 = \frac{\text{total JK}}{\text{total db}} = \frac{127,96}{20} = 6,398 \longrightarrow \log S^2 = 0,806$$

$$X^2 = 2,3026 \quad [(20)(0,806) - (15,395)] = 1,209$$

$$\text{Faktor koreksi } C = 1 + \frac{1}{3(4-1)} \quad [(0,8 - {}^{1}/_{20})] = 1,0833$$

X^2 (*terkoreksi*) = (1/1,0833) (1,209) = 1,12

X^2 (tabel) $\longrightarrow$ X^2 (0,05 : 12) = 21,00

Kesimpulan X^2 (*terkoreksi*) < X^2 (tabel), maka data **homogen.**

Standar deviasi (s)

$$s = \sqrt{\frac{\Sigma(x_i - x)}{n-1}}$$

$$= \sqrt{\frac{\{(24,30 - 24,73)^2 + \ldots + (25,50 - 24,73)^2\}}{23}}$$

$$= 2,41$$

Uji Normalitas

Tabel 17. Data normalitas bobot badan awal

Xi	F.K	Fn (Xi)	Z	Fo(Xi)	|Fn(Xi) - Fo(Xi)|	|Fn(Xi-1) – Fo(Xi)|
21,00	1	0,0417	-1,5477	0,0612	0,0195	0,0612
21,20	2	0,0833	-1,4647	0,0722	0,0111	0,0305
21,30	3	0,1250	-1,4232	0,0778	0,0472	0,0055
22,20	4	0,1667	-1,0498	0,1481	0,0186	0,0231
22,90	5	0,2083	-0,7593	0,2251	0,0168	0,0584
23,00	6	0,2500	-0,7178	0,2374	0,0126	0,0291
23,40	7	0,2917	-0,5519	0,2912	0,0005	0,0412
23,50	8	0,3333	-0,5104	0,3050	0,0283	0,0133
23,60	9	0,3750	-0,4689	0,3210	0,0540	0,0123
23,70	11	0,4583	-0,4174	0,3354	0,1229	0,0396
24,20	12	0,5000	-0,2199	0,4149	0,0851	0,0434
24,30	13	0,5417	-0,1784	0,4306	0,1111	0,0694
24,50	14	0,5833	-0,0954	0,4641	0,1192	0,0776
25,20	15	0,6250	0,1950	0,5753	0,0497	0,0008
25,50	17	0,7083	0,3195	0,6236	0,0847	0,0014
26,20	19	0,7917	0,6099	0,7274	0,0643	0,0191
27,50	20	0,8333	1,1494	0,8739	0,0406	0,0822
27,80	21	0,8750	1,2739	0,8980	0,0230	0,0647
28,80	22	0,9167	1,6888	0,9540	0,0373	0,0790
28,90	23	0,9585	1,7303	0,9582	0,0003	0,0415
29,10	24	1,0000	1,8133	0,949	0,0351	0,0064

$\bar{X} = 24,43$

$S = 2,41$

D(*hitung*) = 0,0822

D(*tabel*) $\rightarrow$(0,05 :24) = 0,242

Kesimpulan : D*(hitung)* < D(*tabel*), maka data **terdistribusi normal.**

Perhitungan Anova

$$\mathbf{FK} = \frac{(\Sigma\Sigma\, Y_{ij})^2}{\sum_{i=1}^{n} ni} = \frac{(592,9)^2}{24} = 14647,10$$

$$\mathbf{JKT} = \Sigma\Sigma\, (Y_{ij})^2 - FK = \left\{(24,30)^2 + (22,20)^2 + \ldots + (25,50)^2\right\} - FK$$
$$= 14795,88 - 14647,10$$
$$= 148,78$$

$$\mathbf{JKP} = \Sigma_i (\Sigma_j\, Y_{ij})^2 - FK$$
$$= \frac{\left\{(138,70)^2 + (153,00)^2 + (150,40)^2 + (150,80)^2\right\}}{6} - FK$$
$$= 14667,92 - 14647,10$$
$$= 20,82$$

$$\mathbf{JKG} = JKT - JKP = 148,78 - 20,82 = 127,96$$

$$\mathbf{KTP} = JKP \,/\, db\ P = 2082/3 = 6,94$$

$$\mathbf{KTG} = JKG \,/\, dbG = 127,96/20 = 6,39$$

$$\mathbf{Fhit} = KTP \,/\, KTG = 6,94/6,39 = 1,09$$

Tabel 18. Anova bobot badan awal

Sumber Variansi	db	JK	KT	F hitung	F Tabel 5 %	F Tabel 1 %
Perlakuan	3	20,82	6,94	$1,09^{ns}$	3,10	4,94
Galat	20	127,96	6,39			
Total	23	148,78				

ns= non signifikan

$$\mathbf{CV} = \frac{\sqrt{KTG}}{\hat{y}} \times 100\% = \frac{\sqrt{6,39}}{98,82} \times 100\% = 2,56\ \%$$

Lampiran 05. Perhitungan statistik bobot badan akhir (g)

Tabel 19. Data rata-rata bobot badan akhir

DOSIS (Mg)	ULANGAN						∑	Rataan
	1	2	3	4	5	6		
0	32,6	31,9	31,3	33,6	23,3	33,7	196,40	32,73
14	32,1	30	33,7	26,8	31,9	37,5	192,00	32,00
28	34,6	33,2	28,1	32,8	29,6	34,5	192,78	32,13
56	36,1	35	33,5	40,8	29,8	37,5	212,70	35,45
∑							793,88	132,31

Uji Homogenitas (Uji Bartlett)

$$JK_{P0} = [(32,60)^2 + \ldots\ldots + (33,70)^2] - \frac{(196,40)^2}{6} = 4,77$$

$$JK_{P1} = [(32,10)^2 + \ldots\ldots + (37,50)^2] - \frac{(192,00)^2}{6} = 64,20$$

$$JK_{P2} = [(34,60)^2 + \ldots\ldots + (34,50)^2] - \frac{(192,78)^2}{6} = 37,24$$

$$JK_{P3} = [(36,10)^2 + \ldots\ldots + (37,50)^2] - \frac{(212,70)^2}{6} = 69,18$$

$$S_{P0} = \frac{JK_{P0}}{db_{P0}} = \frac{4,77}{5} = 0,95 \rightarrow \log S_{P0} = -0,021$$

$$S_{P1} = \frac{JK_{P1}}{db_{P1}} = \frac{64,20}{5} = 12,84 \rightarrow \log S_{P1} = 1,110$$

$$S_{P2} = \frac{JK_{P2}}{db_{P2}} = \frac{37,24}{5} = 7,45 \rightarrow \log S_{P2} = 0,870$$

$$S_{P3} = \frac{JK_{P3}}{db_{P3}} = \frac{69,175}{5} = 13,84 \rightarrow \log S_{P2} = 1,140$$

Tabel 20. Uji Bartlett bobot badan akhir

Perlakuan	db	1/db	JK	Si	Log Si	db Log Si
P0	5	0,2	4,77	0,954	-0,0205	-0,1025
P1	5	0,2	64,20	12,840	1,1086	5,5430
P2	5	0,2	37,24	7,448	0,8720	4,360
P3	5	0,2	69,18	13,836	1,1410	5,705
Total	20	0,8				15,510

$S^2 = \frac{\text{total JK}}{\text{total db}} = \frac{175,39}{20} = 8,77 \longrightarrow \log S^2 = 0,941$

$X^2 = 2,3026 \quad [(20)(0,941) - (15,51)] = 7,62$

Faktor koreksi $C = 1 + \frac{1}{4(4-1)} \quad [(0,8 - {}^{1}/_{20})] = 1,0833$

X^2 (*terkoreksi*) = (1/1,0833) (7,62) = 7,03

X^2 (tabel) $\longrightarrow X^2 (0,05 : 12) = 21,00$

Kesimpulan X^2 (*terkoreksi*) < X^2 (tabel), maka data **homogen.**

Uji Normalitas

Tabel 21. Data normalitas bobot badan akhir

Xi	F.K	Fn (Xi)	Z	Fo(Xi)	Fn(Xi) - Fo(Xi)	Fn(Xi-1) – Fo(Xi)
26,80	1	0,0417	-2,0265	0.0215	0,0202	0,0215
28,10	2	0,0833	-1,6069	0,0543	0,0290	0,0126
29,60	3	0,1250	-1,1229	0,1314	0,0064	0,0481
29,80	4	0,1667	-1,0584	0,1458	0,0209	0,0208
30,00	5	0,2083	-0,9939	0,1611	0,0472	0,0056
31,30	6	0,2500	-0,5744	0,2843	0,0343	0,0760
31,90	8	0,3333	-0,3808	0,3520	0,0187	0,1020
32,10	9	0,3750	-0,3162	0,3764	0,0014	0,0431
32,60	10	0,4167	-0,1549	0,4404	0,0273	0,0654
32,80	11	0,4583	-0,0904	0,4641	0,0058	0,0474
33,20	12	0,5000	0,0387	0,5140	0,0140	0,0557
33,30	13	0,5417	0,0709	0,5279	0,0138	0,0279
33,50	14	0,5833	0,1355	0,5537	0,0296	0,0120
33,60	15	0,6250	0,1678	0,5656	0,0594	0,0177
33,70	17	0,7083	0,2001	0,5793	0,1290	0,0457
34,50	18	0,7917	0,4582	0,6754	0,0746	0,0329
34,60	19	0,8333	0,4905	0,6879	0,1038	0,0621
35,00	20	0,8750	0,6196	0,7308	0,1025	0,0609
36,10	21	0,9167	0,9745	0,8340	0,0410	0,0070
37,50	23	0,9585	1,4263	,09229	0,0354	0,0479
40,80	24	1,0000	2,4911	0,9963	0,0064	0,0353

$\overline{X} = 33,08$

$S = 3,099$

D(*hitung*) = 0,1020

D(*tabel*) $\rightarrow$(0,05 :24) = 0,242

Kesimpulan : D*(hitung)* < D(*tabel*), maka data **terdistribusi normal.**

Standar deviasi (s)

$$s = \sqrt{\frac{\Sigma(x_i - x)}{n-1}}$$

$$= \sqrt{\frac{\{(32,60 - 33,08)^2 + \ldots + (37,50 - 33,08)^2\}}{23}}$$

$$= 3,01$$

Perhitungan Anova

$$\mathbf{FK} = \frac{(\Sigma\Sigma Y_{ij})^2}{n} = \frac{(793,88)^2}{24} = 26260,23$$

$$\Sigma ni$$
$$i=1$$

$$\mathbf{JKT} = \Sigma\Sigma (Y_{ij})^2 - FK = \{(32,6)^2 + \ldots\ldots + (37,5)^2\} - FK$$
$$= 26482,45 - 26260,23$$
$$= 222,22$$

$$\mathbf{JKP} = \Sigma_i (\Sigma_j Y_{ij})^2 - FK$$
$$= \frac{\{(196,40)^2 + (192)^2 + (192,78)^2 + (212,70)^2\}}{6} - FK$$
$$= 26307,06 - 26260,23$$
$$= 46,83$$

$$\mathbf{JKG} = JKT - JKP = 222,22 - 46,83 = 175,39$$

Tabel 22. Anova data bobot badan akhir

Sumber Variansi	db	JK	KT	F hitung	F Tabel 5 %	F Tabel 1 %
Perlakuan	3	46,83	15,61	1,78 ns	3,10	4,94
Galat	20	175,39	8,76			
Total	23	222,22				

ns= tidak signifikan

$$\mathbf{CV} = \sqrt{\frac{KTG}{\hat{y}}} \times 100\% = \sqrt{\frac{8,76}{132,31}} \times 100\% = 2,24\%$$

$S^2 = \frac{\text{total JK}}{\text{total db}} = \frac{67,821}{20} = 3,39 \longrightarrow \log S^2 = 0,53$

$X^2 = 2,3026\ [(20)(0,53) - (8,16)] = 5,62$

Faktor koreksi $C = 1 + \frac{1}{3(4-1)}\ [(0,8 - {}^{1}/_{20})] = 1,0833$

X^2 (*terkoreksi*) = (1/1,0833) (7,62) = 5,19

X^2 (tabel) $\longrightarrow$ X^2 (0,05 : 12) = 21,00

Kesimpulan X^2 (*terkoreksi*) < X^2 (tabel), maka data **homogen.**

Uji Normalitas

Tabel 25. Data normalitas pertambahan bobot badan

Xi	F.K	Fn (Xi)	Z	Fo(Xi)	|Fn(Xi) - Fo(Xi)|	|Fn(Xi-1) – Fo(Xi)|
1,00	1	0,0417	-0,8715	0,1922	0,1505	0,1922
1,60	2	0,0833	-0,7068	0,2405	0,1572	0,1988
1,80	3	0,1250	-0,6521	0,2578	0,1328	0,1740
2,15	4	0,1667	-0,5562	0,2895	0,1228	0,1645
2,20	5	0,2083	-0,5425	0,2946	0,0863	0,1279
2,30	6	0,2500	-0,5151	0,3050	0,0550	0,0967
2,85	7	0,2917	-0,3644	0,3594	0,0677	0,1094
2,95	8	0,3333	-0,3369	0,3688	0,0355	0,0771
3,50	9	0,3750	-0,1863	0,4267	0,0517	0,0934
3,70	10	0,4167	-0,1315	0,4483	0,0316	0,0733
3,80	11	0,4583	-0,1042	0,4602	0,0019	0,0435
4,15	12	0,5000	-0,0082	0,4980	0,0020	0,0397
4,35	13	0,5417	-0,0466	0,4821	0,0596	0,0179
4,50	14	0,5833	0,0877	0,5339	0,0494	0,0081
4,70	15	0,6250	0,1425	0,5557	0,0693	0,0276
4,75	16	0,6667	01562	0,5616	0,1051	0,0634
4,85	17	0,7083	0,1836	0,5714	0,1369	0,0953
5,00	18	0,75000	0,2247	0,5871	0,1629	0,1212
5,85	19	0,7917	0.4575	0,6754	0,1163	0,0746
6,05	20	0,8333	0,5123	0,6950	0,1383	0,0967
6,15	21	0,8750	0,5397	07037	0,1713	0,1296
6,20	22	0,9167	0,5534	0,7088	0,2079	0,1662
7,45	23	0,9585	0,8959	0,8133	0,1450	0,1034
8,55	24	1,0000	1,1973	0,8830	0,1170	0,0453

$\bar{X} = 4,18$

S = 3,65

D(*hitung*) = 0,1988

D(*tabel*) $\rightarrow$(0,05 :24) = 0,242

Kesimpulan : D*(hitung)* < D(*tabel*), maka data **terdistribusi normal.**

Standar deviasi (s)

$$s = \sqrt{\frac{\Sigma(x_i - x)}{n-1}}$$

$$= \sqrt{\frac{\{(4,15 - 4,18)^2 + \ldots + (6,05 - 4,18)^2\}}{23}}$$

$$= 3,65$$

Perhitungan Anova

$$\mathbf{FK} = \frac{(\Sigma\Sigma Y_{ij})^2}{\sum_{i=1} n_i} = \frac{(100,40)^2}{24} = 420,01$$

$$\mathbf{JKT} = \Sigma\Sigma (Y_{ij})^2 - FK = \{(4,15)^2 + \ldots\ldots + (6,05)^2\} - FK$$
$$= 504 - 420,01$$
$$= 83,99$$

$$\mathbf{JKP} = \Sigma_i (\Sigma_j Y_{ij})^2 - FK$$
$$= \frac{\{(28,85)^2 + (19,35)^2 + (21,2)^2 + (31,00)^2\}}{6} - FK$$
$$= 436,19 - 420,01$$
$$= 16,19$$

$$\mathbf{JKG} = JKT - JKP = 83,99 - 16,19 = 67,80$$

Tabel 26. Anova data pertambahan bobot badan

Sumber Variansi	db	JK	KT	F hitung	F Tabel 5 %	F Tabel 1 %
Perlakuan	3	16,19	5,39	$1,59^{ns}$	3,10	4,94
Galat	20	67,80	3,39			
Total	23	83,99				

ns= tidak signifikan

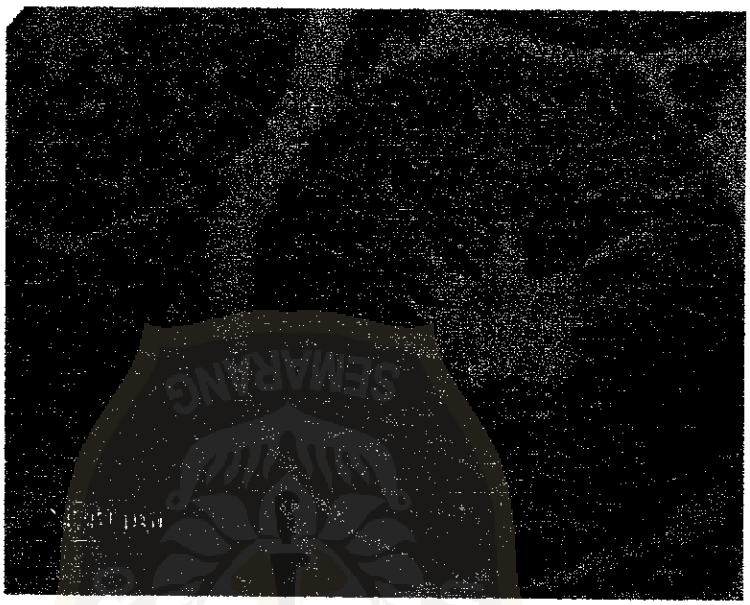
$$\mathbf{CV} = \frac{\sqrt{KTG}}{\hat{y}} \times 100\% = \frac{\sqrt{3,39}}{16,74} \times 100\% = 10,99\ \%$$

Lampiran 07. Data suhu harian (^{0}C)

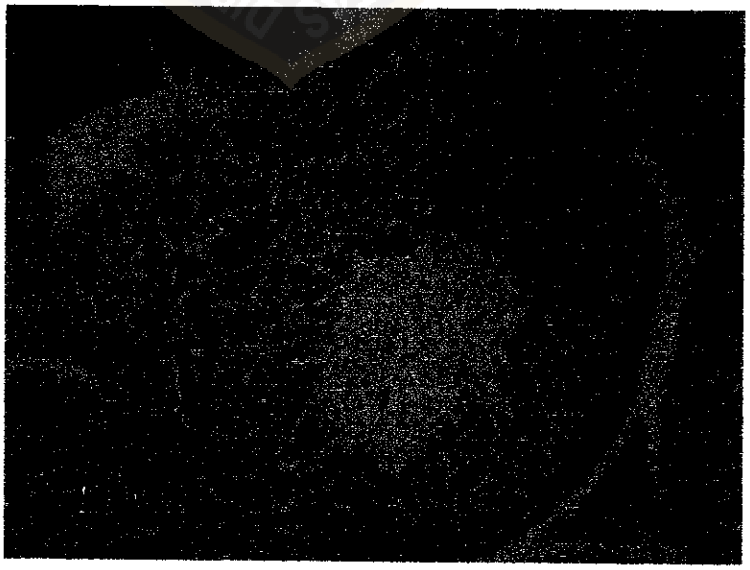
Tabel 27. Data rata-rata suhu

Minggu Ke	Pagi	siang	Sore
I	25,71	28,50	25,71
II	25,71	28,57	27,71
III	25,14	28,00	28,79
IV	25,57	28,29	27,14
V	25,71	28,57	27,43
VI	25,42	28,57	26,85
VII	25,14	27,57	26,29
Terakhir	24,71	28,14	26,86

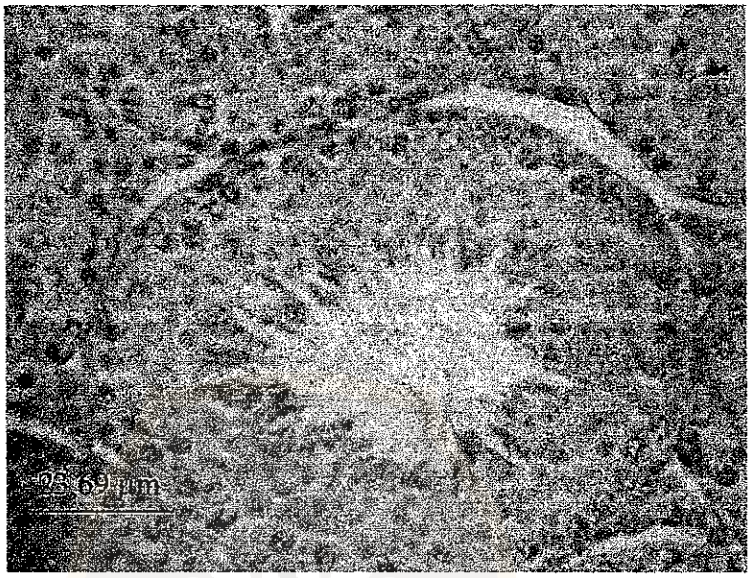
Lampiran 08. Gambaran histologis tubulus seminiferus mencit setelah diberi perlakuan pasak bumi selama 48 hari secara Oral



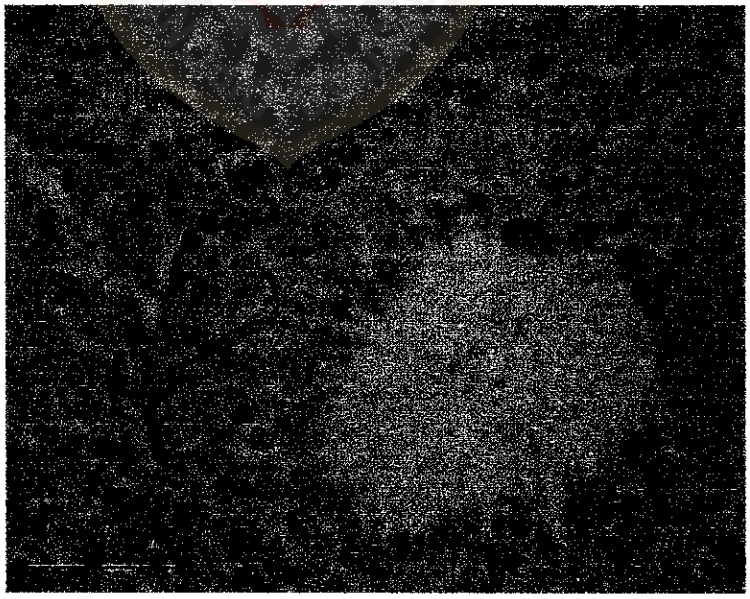
Gambar 05. Perlakuan kontrol



Gambar 06. Perlakuan 0,14 mg/ml/ekor/hari



Gambar 07. Perlakuan 0,28 mg/ml/ekor/hari



Gambar 08. Perlakuan 0,56 mg/ml/ekor/hari