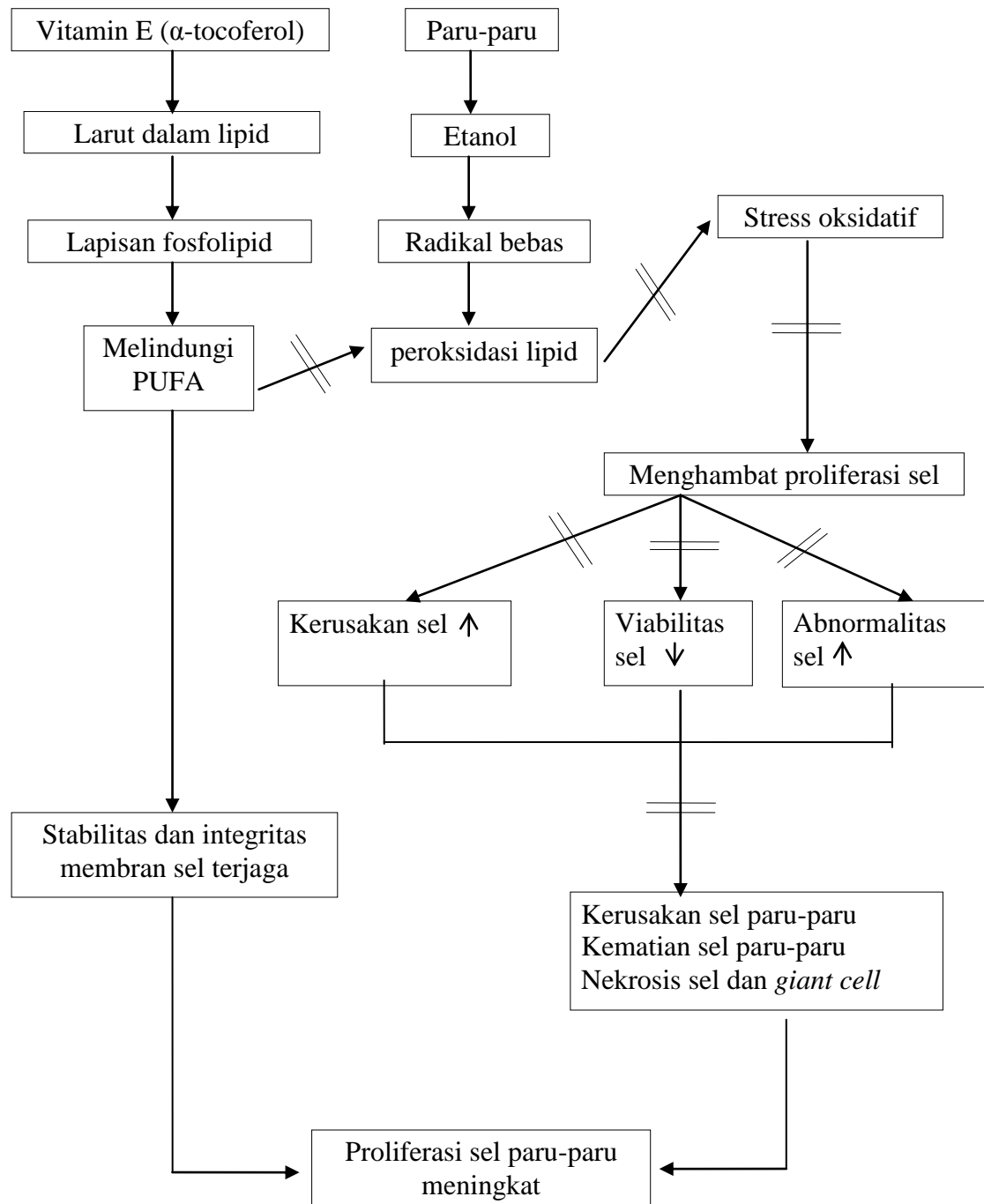
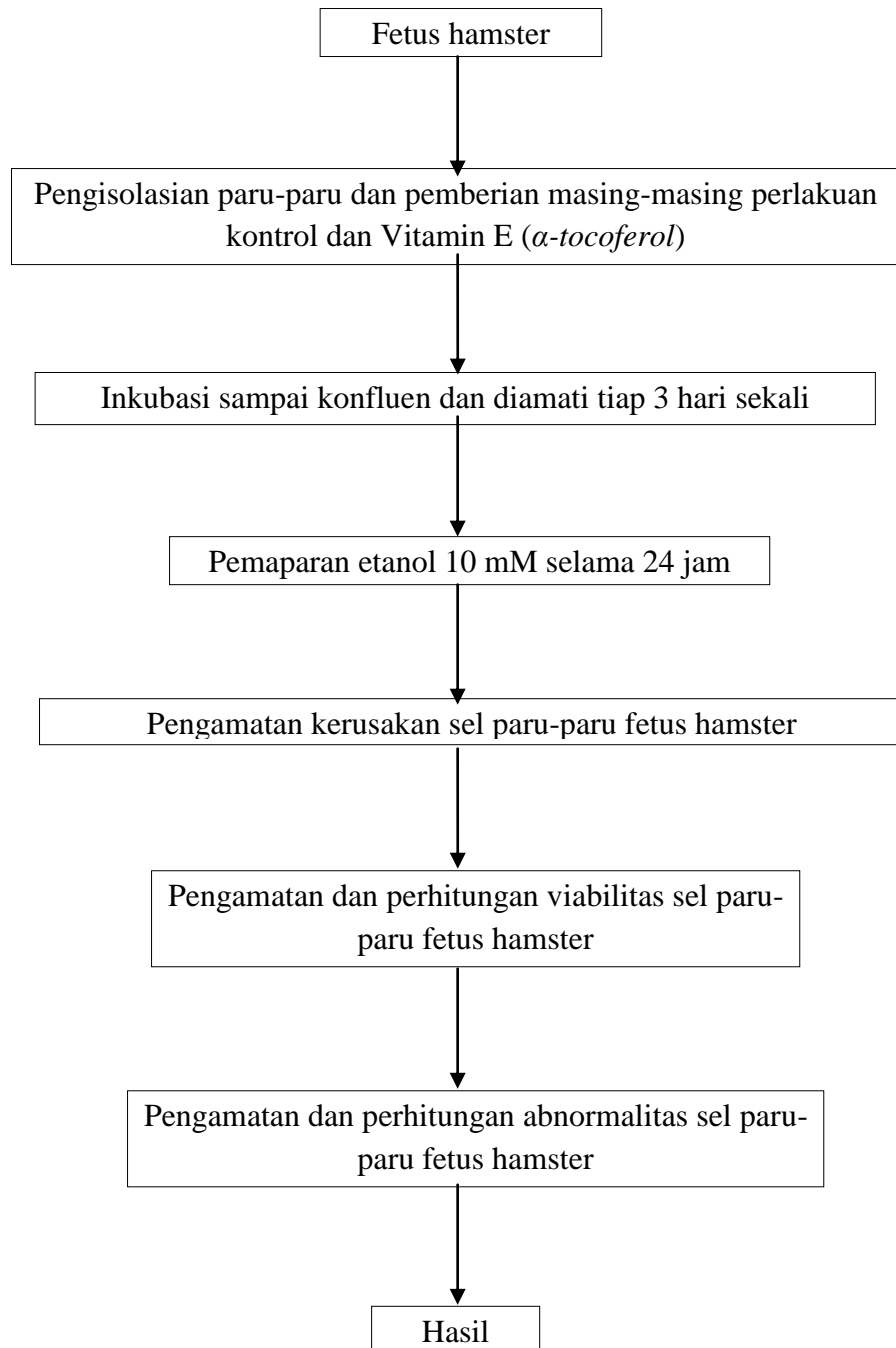


Lampiran 1. Konsep Kerangka Penelitian



## Lampiran 2. Diagram Kegiatan Penelitian



Lampiran 3. Data Pengamatan Kerusakan Kultur Primer Sel Paru-Paru Fetus Hamster setelah Perlakuan Vitamin E ( *$\alpha$ -tocoferol*) dan Pemaparan Etanol 10 mM selama 24 jam

| Perlakuan                  | Kerusakan Sel (%) |    |    |    |    |    |     |    |    | Jumlah | Rata-rata |
|----------------------------|-------------------|----|----|----|----|----|-----|----|----|--------|-----------|
|                            | Ulangan           |    |    |    |    |    |     |    |    |        |           |
|                            | 1                 |    |    | 2  |    |    | 3   |    |    |        |           |
|                            | SB                | SS | SL | SB | SS | SL | SB  | SS | SL |        |           |
| K (-)                      | 0                 | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0      | 0,00      |
| K (+)                      | 85                | 15 | 70 | 80 | 10 | 70 | 85  | 20 | 65 | 205    | 68,33     |
| P <sub>1</sub> 25 $\mu$ M  | 85                | 45 | 40 | 85 | 35 | 50 | 85  | 35 | 50 | 140    | 46,67     |
| P <sub>2</sub> 50 $\mu$ M  | 85                | 40 | 45 | 80 | 40 | 40 | 85  | 45 | 40 | 125    | 41,67     |
| P <sub>3</sub> 75 $\mu$ M  | 85                | 50 | 35 | 80 | 50 | 30 | 80  | 45 | 35 | 100    | 33,33     |
| P <sub>4</sub> 100 $\mu$ M | 85                | 55 | 30 | 85 | 55 | 30 | 85  | 60 | 25 | 85     | 28,33     |
| P <sub>5</sub> 125 $\mu$ M | 100               | 90 | 10 | 95 | 85 | 10 | 100 | 95 | 5  | 25     | 8,33      |

Keterangan : 1. SB (Sebelum Dipapar)  
 2. SS (Sesudah Dipapar)  
 3. SL (Selisih)

Lampiran 4. Analisis Statistik tentang Pengaruh Vitamin E (*α-tocoferol*) terhadap Kerusakan Kultur Primer Sel Paru-Paru Fetus Hamster yang Dipapar Etanol

| Perlakuan             | Kerusakan Sel (%) |    |    | Jumlah | Rata-rata |
|-----------------------|-------------------|----|----|--------|-----------|
|                       | Ulangan           |    |    |        |           |
|                       | 1                 | 2  | 3  |        |           |
| K (-)                 | 0                 | 0  | 0  | 0      | 0,00      |
| K (+)                 | 70                | 70 | 65 | 205    | 68,33     |
| P <sub>1</sub> 25 μM  | 40                | 50 | 50 | 140    | 46,67     |
| P <sub>2</sub> 50 μM  | 45                | 40 | 40 | 125    | 41,67     |
| P <sub>3</sub> 75 μM  | 35                | 30 | 35 | 100    | 33,33     |
| P <sub>4</sub> 100 μM | 30                | 30 | 25 | 85     | 28,33     |
| P <sub>5</sub> 125 μM | 10                | 10 | 5  | 25     | 8,33      |
| Jumlah                |                   |    |    | 680    | 226,66    |

$$\bar{X} = \frac{680}{21} = 32,38$$

$$FK = \frac{680^2}{21} = \frac{462400}{21} = 22019,05$$

$$\begin{aligned} JK \text{ Total Percobaan} &= 0^2 + 0^2 + 0^2 + 70^2 + 70^2 + 65^2 + 40^2 + 50^2 + 50^2 + 45^2 + \\ &\quad 40^2 + 40^2 + 35^2 + 30^2 + 35^2 + 30^2 + 30^2 + 25^2 + 10^2 + 10^2 \\ &\quad + 5^2 - FK \\ &= 0 + 0 + 0 + 4900 + 4900 + 4225 + 1600 + 2500 + 2500 + \\ &\quad 2025 + 1600 + 1600 + 1225 + 900 + 1225 + 900 + 900 + \\ &\quad 625 + 100 + 100 + 25 - FK \\ &= 31850 - 22019,05 = 9830,95 \end{aligned}$$

$$\begin{aligned} JK \text{ Perlakuan} &= \frac{0^2 + 205^2 + 140^2 + 125^2 + 100^2 + 85^2 + 25^2}{3} - FK \\ &= \frac{0 + 42025 + 19600 + 15625 + 10000 + 7225 + 625}{3} - FK \\ &= \frac{95100}{3} - 22019,05 = 31700 - 22019,05 = 9680,95 \end{aligned}$$

$$\begin{aligned} JK \text{ Galat} &= JK \text{ Total Percobaan} - JK \text{ Perlakuan} \\ &= 9830,95 - 9680,95 = 150 \end{aligned}$$

## ANAVA

| SK        | db | JK      | KT      | F Hitung | F Tabel 5% | F Tabel 1% |
|-----------|----|---------|---------|----------|------------|------------|
| Perlakuan | 6  | 9680,95 | 1613,49 | 150,65   | 2,85       | 4,46       |
| Galat     | 14 | 150,00  | 10,71   |          |            |            |
| Total     | 20 |         |         |          |            |            |

F Hitung > F Tabel maka  $H_1$  diterima

Jadi ada perbedaan pengaruh pemberian vitamin E terhadap kerusakan kultur primer sel paru-paru fetus hamster setelah dipapar etanol

$$KK = \frac{\sqrt{KT \text{ Galat}}}{y \text{ (rerata)}} \times 100 = \frac{\sqrt{10,71}}{32,38} \times 100 = 10,11 = 10\%$$

KK bernilai 10% sehingga uji lanjut yang dipakai adalah Beda Nyata Terkecil (BNT), karena syaratnya adalah antara 5%-10% pada kondisi homogen.

Uji lanjut BNT 5%

$$\begin{aligned} BNT\alpha &= t\alpha_{(0,05)}(db \text{ Galat}) \times \sqrt{\frac{2 \cdot KT \text{ Galat}}{\text{Ulangan}}} \\ &= 2,145 \times \sqrt{\frac{2 \cdot 10,71}{3}} \\ &= 2,145 \times \sqrt{\frac{21,42}{3}} \\ &= 2,145 \times \sqrt{7,14} \\ &= 2,145 \times 2,67 = 5,73 \end{aligned}$$

Uji lanjut BNT 1%

$$\begin{aligned} BNT\alpha &= t\alpha_{(0,01)}(db \text{ Galat}) \times \sqrt{\frac{2 \cdot KT \text{ Galat}}{\text{Ulangan}}} \\ &= 2,977 \times \sqrt{\frac{2 \cdot 10,71}{3}} \\ &= 2,977 \times \sqrt{\frac{21,42}{3}} \\ &= 2,977 \times \sqrt{7,14} \\ &= 2,977 \times 2,67 = 7,95 \end{aligned}$$

| Perlakuan                  | Rata-rata (%) | Notasi 5% | Notasi 1% |
|----------------------------|---------------|-----------|-----------|
| K (-)                      | 0,00          | a         | a         |
| P <sub>5</sub> 125 $\mu$ M | 8,33          | b         | b         |
| P <sub>4</sub> 100 $\mu$ M | 28,33         | c         | c         |
| P <sub>3</sub> 75 $\mu$ M  | 33,33         | c         | c         |
| P <sub>2</sub> 50 $\mu$ M  | 41,67         | d         | d         |
| P <sub>1</sub> 25 $\mu$ M  | 46,67         | d         | d         |
| K (+)                      | 68,33         | e         | e         |

Lampiran 5. Data Pengamatan Viabilitas Kultur Primer Sel Paru-Paru Fetus Hamster setelah Perlakuan Vitamin E ( *$\alpha$ -tocoferol*) dan Pemaparan Etanol 10 mM selama 24 jam

| Perlakuan                              | Ulangan | Jumlah sel dalam 5 kotak haemocytometer |              |    |      |        | Sel/ml             | Total sel | Viabilitas sel (%) |
|--|---------|---|--------------|----|------|--------|--------------------|-----------|--------------------|
|  |         | Kotak                                   | Hidup        |    | Mati | Jumlah |                    |           |                    |
|  | normal  |   | tidak normal |    |      |        |                    |           |                    |
| K (-)                                  | 1       | 1                                       | 9            | 1  | 4    | 14     | $27,6 \times 10^4$ | 27600     | 78,26 %            |
|  |         | 2                                       | 7            | 2  | 3    | 12     |                    |           |                    |
|  |         | 3                                       | 9            | 1  | 3    | 13     |                    |           |                    |
|  |         | 4                                       | 10           | 1  | 4    | 15     |                    |           |                    |
|  |         | 5                                       | 12           | 2  | 1    | 15     |                    |           |                    |
|  | Jumlah  |   | 47           | 7  | 15   | 69     |                    |           |                    |
|  | 2       | 1                                       | 16           | 1  | 3    | 20     | $33,2 \times 10^4$ | 33200     | 81,93 %            |
|  |         | 2                                       | 6            | 3  | 4    | 13     |                    |           |                    |
|  |         | 3                                       | 17           | 2  | 2    | 21     |                    |           |                    |
|  |         | 4                                       | 8            | 3  | 2    | 13     |                    |           |                    |
|  |         | 5                                       | 11           | 1  | 4    | 16     |                    |           |                    |
|  | Jumlah  |   | 58           | 10 | 15   | 83     |                    |           |                    |
|  | 3       | 1                                       | 11           | 3  | 5    | 19     | $30,4 \times 10^4$ | 30400     | 80,26 %            |
|  |         | 2                                       | 6            | 2  | 4    | 12     |                    |           |                    |
|  |         | 3                                       | 11           | 1  | 3    | 15     |                    |           |                    |
| 4                                      |         | 12                                      | 1            | 2  | 15   |        |                    |           |                    |
| 5                                      |         | 12                                      | 2            | 1  | 15   |        |                    |           |                    |
| Jumlah                                 |         | 52                                      | 9            | 15 | 76   |        |                    |           |                    |
| Rata-rata total sel dan viabilitas sel |         |   |              |    |      |        | 30400              | 80,15 %   |                    |
| K (+)                                  | 1       | 1                                       | 4            | 4  | 6    | 14     | $26,4 \times 10^4$ | 26400     | 60,61 %            |
|  |         | 2                                       | 1            | 5  | 5    | 11     |                    |           |                    |
|  |         | 3                                       | 3            | 8  | 7    | 18     |                    |           |                    |
|  |         | 4                                       | 2            | 6  | 5    | 13     |                    |           |                    |
|  |         | 5                                       | 2            | 5  | 3    | 10     |                    |           |                    |
|  | Jumlah  |   | 12           | 28 | 26   | 66     |                    |           |                    |
|  | 2       | 1                                       | 5            | 3  | 6    | 14     | $28 \times 10^4$   | 28000     | 58,57 %            |
|  |         | 2                                       | 1            | 4  | 5    | 10     |                    |           |                    |
|  |         | 3                                       | 5            | 6  | 7    | 18     |                    |           |                    |
|  |         | 4                                       | 1            | 7  | 5    | 13     |                    |           |                    |
|  |         | 5                                       | 4            | 5  | 6    | 15     |                    |           |                    |
|  | Jumlah  |   | 16           | 25 | 29   | 70     |                    |           |                    |
|  | 3       | 1                                       | 7            | 5  | 5    | 17     | $30,8 \times 10^4$ | 30800     | 59,74 %            |
|  |         | 2                                       | 6            | 5  | 5    | 16     |                    |           |                    |
|  |         | 3                                       | 4            | 3  | 8    | 15     |                    |           |                    |
| 4                                      |         | 1                                       | 6            | 6  | 13   |        |                    |           |                    |

|  |        |    |    |    |     |                        |                        |          |         |
|--|--------|----|----|----|-----|------------------------|------------------------|----------|---------|
|  |        | 5  | 5  | 4  | 7   | 16                     |                        |          |         |
|  | Jumlah |    | 23 | 23 | 31  | 77                     |                        |          |         |
| Rata-rata total sel dan viabilitas sel |        |    |    |    |     |                        |                        | 28400    | 59,64 % |
| P <sub>1</sub><br>25 $\mu$ M           | 1      | 1  | 14 | 3  | 4   | 21                     | 43,2 x 10 <sup>4</sup> | 43200    | 69,44 % |
|  |        | 2  | 7  | 6  | 6   | 19                     |                        |          |         |
|  |        | 3  | 14 | 5  | 5   | 24                     |                        |          |         |
|  |        | 4  | 8  | 4  | 6   | 18                     |                        |          |         |
|  |        | 5  | 11 | 3  | 12  | 26                     |                        |          |         |
|  | Jumlah |    | 54 | 21 | 33  | 108                    |                        |          |         |
|  | 2      | 1  | 7  | 4  | 6   | 17                     | 27,6 x 10 <sup>4</sup> | 27600    | 68,12 % |
|  |        | 2  | 9  | 3  | 4   | 16                     |                        |          |         |
|  |        | 3  | 1  | 5  | 5   | 11                     |                        |          |         |
|  |        | 4  | 5  | 3  | 4   | 12                     |                        |          |         |
|  |        | 5  | 6  | 4  | 3   | 13                     |                        |          |         |
|  | Jumlah |    | 28 | 19 | 22  | 69                     |                        |          |         |
|  | 3      | 1  | 3  | 6  | 6   | 15                     | 41,6 x 10 <sup>4</sup> | 41600    | 69,23 % |
|  |        | 2  | 13 | 3  | 5   | 21                     |                        |          |         |
|  |        | 3  | 14 | 4  | 7   | 25                     |                        |          |         |
| 4                                      |        | 8  | 5  | 6  | 19  |                        |                        |          |         |
| 5                                      |        | 12 | 4  | 8  | 24  |                        |                        |          |         |
| Jumlah                                 |        | 50 | 22 | 32 | 104 |                        |                        |          |         |
| Rata-rata total sel dan viabilitas sel |        |    |    |    |     |                        |                        | 37466,67 | 68,93 % |
| P <sub>2</sub><br>50 $\mu$ M           | 1      | 1  | 6  | 4  | 5   | 15                     | 42 x 10 <sup>4</sup>   | 42000    | 71,43 % |
|  |        | 2  | 11 | 6  | 8   | 25                     |                        |          |         |
|  |        | 3  | 14 | 3  | 3   | 20                     |                        |          |         |
|  |        | 4  | 12 | 5  | 9   | 26                     |                        |          |         |
|  |        | 5  | 12 | 2  | 5   | 19                     |                        |          |         |
|  | Jumlah |    | 55 | 20 | 30  | 105                    |                        |          |         |
|  | 2      | 1  | 12 | 4  | 6   | 22                     | 44,4 x 10 <sup>4</sup> | 44400    | 73,87 % |
|  |        | 2  | 19 | 3  | 5   | 27                     |                        |          |         |
|  |        | 3  | 10 | 5  | 8   | 23                     |                        |          |         |
|  |        | 4  | 10 | 4  | 5   | 19                     |                        |          |         |
|  |        | 5  | 13 | 2  | 5   | 20                     |                        |          |         |
|  | Jumlah |    | 64 | 18 | 29  | 111                    |                        |          |         |
|  | 3      | 1  | 10 | 3  | 7   | 20                     | 43,2 x 10 <sup>4</sup> | 43200    | 71,3 %  |
|  |        | 2  | 13 | 3  | 6   | 22                     |                        |          |         |
|  |        | 3  | 7  | 5  | 6   | 18                     |                        |          |         |
| 4                                      |        | 14 | 4  | 5  | 23  |                        |                        |          |         |
| 5                                      |        | 13 | 5  | 7  | 25  |                        |                        |          |         |
| Jumlah                                 |        | 57 | 20 | 31 | 108 |                        |                        |          |         |
| Rata-rata total sel dan viabilitas sel |        |    |    |    |     |                        |                        | 43200    | 72,2 %  |
| 1                                      | 1      | 16 | 2  | 7  | 25  | 47,2 x 10 <sup>4</sup> | 47200                  | 75,42 %  |         |
|  | 2      | 9  | 3  | 8  | 20  |                        |                        |          |         |
|  | 3      | 20 | 2  | 4  | 26  |                        |                        |          |         |

|  |        |    |     |    |     |     |                        |          |         |
|--|--------|----|-----|----|-----|-----|------------------------|----------|---------|
| P <sub>3</sub><br>75 μM                |        | 4  | 14  | 4  | 5   | 23  | 49,2 x 10 <sup>4</sup> | 49200    | 74,8 %  |
|  |        | 5  | 18  | 1  | 5   | 24  |                        |          |         |
|  | Jumlah |    | 77  | 12 | 29  | 118 |                        |          |         |
|  | 2      | 1  | 16  | 2  | 8   | 26  |                        |          |         |
|  |        | 2  | 17  | 3  | 4   | 24  |                        |          |         |
|  |        | 3  | 13  | 4  | 6   | 23  |                        |          |         |
|  |        | 4  | 18  | 2  | 5   | 25  |                        |          |         |
|  |        | 5  | 13  | 4  | 8   | 25  |                        |          |         |
|  | Jumlah |    | 77  | 15 | 31  | 123 |                        |          |         |
|  | 3      | 1  | 16  | 3  | 10  | 29  |                        |          |         |
|  |        | 2  | 17  | 2  | 5   | 24  |                        |          |         |
|  |        | 3  | 20  | 1  | 6   | 27  |                        |          |         |
|  |        | 4  | 11  | 3  | 7   | 21  |                        |          |         |
| 5                                      |        | 16 | 4   | 4  | 24  |     |                        |          |         |
| Jumlah                                 |        | 80 | 13  | 32 | 125 |     |                        |          |         |
| Rata-rata total sel dan viabilitas sel |        |    |     |    |     |     |                        | 48800    | 74,87 % |
| P <sub>4</sub><br>100 μM               | 1      | 1  | 19  | 2  | 5   | 26  | 51,2 x 10 <sup>4</sup> | 51200    | 79,69 % |
|  |        | 2  | 15  | 2  | 6   | 23  |                        |          |         |
|  |        | 3  | 22  | 2  | 6   | 30  |                        |          |         |
|  |        | 4  | 19  | 3  | 5   | 27  |                        |          |         |
|  |        | 5  | 17  | 1  | 4   | 22  |                        |          |         |
|  | Jumlah |    | 92  | 10 | 26  | 128 |                        |          |         |
|  | 2      | 1  | 20  | 3  | 6   | 29  | 52 x 10 <sup>4</sup>   | 52000    | 80,77 % |
|  |        | 2  | 17  | 3  | 5   | 25  |                        |          |         |
|  |        | 3  | 20  | 2  | 6   | 28  |                        |          |         |
|  |        | 4  | 18  | 1  | 3   | 22  |                        |          |         |
|  |        | 5  | 20  | 1  | 5   | 26  |                        |          |         |
|  | Jumlah |    | 95  | 10 | 25  | 130 |                        |          |         |
|  | 3      | 1  | 16  | 2  | 5   | 23  | 50 x 10 <sup>4</sup>   | 50000    | 79,2 %  |
|  |        | 2  | 21  | 2  | 6   | 29  |                        |          |         |
|  |        | 3  | 16  | 1  | 5   | 22  |                        |          |         |
|  |        | 4  | 18  | 2  | 5   | 25  |                        |          |         |
|  |        | 5  | 20  | 1  | 5   | 26  |                        |          |         |
| Jumlah                                 |        | 91 | 8   | 26 | 125 |     |                        |          |         |
| Rata-rata total sel dan viabilitas sel |        |    |     |    |     |     |                        | 51066,67 | 79,89 % |
|  | 1      | 1  | 18  | 1  | 5   | 24  | 53,2 x 10 <sup>4</sup> | 53200    | 80,45 % |
|  |        | 2  | 20  | 2  | 7   | 29  |                        |          |         |
|  |        | 3  | 20  | 1  | 6   | 27  |                        |          |         |
|  |        | 4  | 23  | 1  | 4   | 28  |                        |          |         |
|  |        | 5  | 19  | 2  | 4   | 25  |                        |          |         |
|  | Jumlah |    | 100 | 7  | 27  | 133 |                        |          |         |
|  | 2      | 1  | 18  | 2  | 4   | 24  | 54 x 10 <sup>4</sup>   | 54000    | 82,96 % |
|  |        | 2  | 23  | 1  | 5   | 29  |                        |          |         |
|  |        | 3  | 19  | 1  | 6   | 26  |                        |          |         |



|                          |  |   |     |   |    |     |                        |       |         |
|--------------------------|--|---|-----|---|----|-----|------------------------|-------|---------|
| P <sub>5</sub><br>125 μM |  | 4 | 26  | 2 | 3  | 31  |                        |       |         |
|                          |  | 5 | 18  | 2 | 5  | 25  |                        |       |         |
|                          | Jumlah                                 |   | 104 | 8 | 23 | 135 |                        |       |         |
|                          | 3                                      | 1 | 21  | 1 | 5  | 27  | 52,4 x 10 <sup>4</sup> | 52400 | 80,92 % |
|                          |  | 2 | 20  | 4 | 7  | 31  |                        |       |         |
|                          |  | 3 | 18  | 1 | 3  | 22  |                        |       |         |
|                          |  | 4 | 22  | 0 | 6  | 28  |                        |       |         |
|                          |  | 5 | 19  | 0 | 4  | 23  |                        |       |         |
|                          | Jumlah                                 |   | 100 | 6 | 25 | 131 |                        |       |         |
|                          | Rata-rata total sel dan viabilitas sel |   |     |   |    |     |                        | 53200 | 81,44 % |

Lampiran 6. Analisis Statistik tentang Pengaruh Vitamin E (*α-tocoferol*) terhadap Viabilitas Kultur Primer Sel Paru-Paru Fetus Hamster yang Dipapar Etanol

| Perlakuan             | Viabilitas Sel (%) |       |       | Jumlah  | Rata-rata |
|-----------------------|--------------------|-------|-------|---------|-----------|
|                       | Ulangan            |       |       |         |           |
|                       | 1                  | 2     | 3     |         |           |
| K (-)                 | 78,26              | 81,93 | 80,26 | 240,45  | 80,15     |
| K (+)                 | 60,61              | 58,57 | 59,74 | 178,92  | 59,64     |
| P <sub>1</sub> 25 μM  | 69,44              | 68,12 | 69,23 | 206,79  | 68,93     |
| P <sub>2</sub> 50 μM  | 71,43              | 73,87 | 71,30 | 216,60  | 72,20     |
| P <sub>3</sub> 75 μM  | 75,42              | 74,80 | 74,40 | 224,62  | 74,87     |
| P <sub>4</sub> 100 μM | 79,69              | 80,77 | 79,20 | 239,66  | 79,89     |
| P <sub>5</sub> 125 μM | 80,45              | 82,96 | 80,92 | 244,33  | 81,44     |
| Jumlah                |                    |       |       | 1551,37 | 517,12    |

$$\bar{X} = \frac{1551,37}{21} = 73,87$$

$$FK = \frac{1551,37^2}{21} = \frac{2406748,88}{21} = 114607,09$$

$$\begin{aligned} \text{JK Total Percobaan} &= 78,26^2 + 81,93^2 + 80,26^2 + 60,61^2 + 58,57^2 + 59,74^2 + \\ &69,44^2 + 68,12^2 + 69,23^2 + 71,43^2 + 73,87^2 + 71,3^2 + \\ &75,42^2 + 74,8^2 + 74,4^2 + 79,69^2 + 80,77^2 + 79,2^2 + 80,45^2 \\ &+ 82,96^2 + 80,92^2 - FK \\ &= 6124,6276 + 6712,5249 + 6441,6676 + 3673,5721 + \\ &3430,4449 + 3568,8676 + 4821,9136 + 4640,3344 + \\ &4792,7929 + 5102,2449 + 5456,7769 + 5083,69 + \\ &5688,1764 + 5595,04 + 5535,36 + 6350,4961 + \\ &6523,7929 + 6272,64 + 6472,2025 + 6882,3616 + \\ &6548,0464 - FK \\ &= 115717,573 - 114607,09 = 1110,483 \end{aligned}$$

$$\begin{aligned} \text{JK Perlakuan} &= \frac{240,45^2 + 178,92^2 + 206,79^2 + 216,6^2 + 224,62^2 + 239,66^2 + 244,33^2}{3} - FK \\ &= \frac{57816,2025 + 32012,3664 + 42762,1041 + 46915,56 + 50454,1444 + 57436,9156 + 59697,1489}{3} - FK \\ &= \frac{347094,442}{3} - 114607,09 \\ &= 115698,147 - 114607,09 = 1091,057 \end{aligned}$$

$$\begin{aligned} \text{JK Galat} &= \text{JK Total Percobaan} - \text{JK Perlakuan} \\ &= 1110,483 - 1091,057 = 19,426 \end{aligned}$$

## ANAVA

| SK        | db | JK       | KT      | F Hitung | F Tabel 5% | F Tabel 1% |
|-----------|----|----------|---------|----------|------------|------------|
| Perlakuan | 6  | 1091,057 | 181,843 | 131,012  | 2,85       | 4,46       |
| Galat     | 14 | 19,426   | 1,388   |          |            |            |
| Total     | 20 |          |         |          |            |            |

F Hitung > F Tabel maka  $H_1$  diterima

Jadi ada perbedaan pengaruh pemberian vitamin E terhadap viabilitas kultur primer sel paru-paru fetus hamster setelah dipapar etanol

$$KK = \frac{\sqrt{\text{KT Galat}}}{y \text{ (rerata)}} \times 100 = \frac{\sqrt{1,388}}{73,87} \times 100 = 1,59 = 2\%$$

KK bernilai 2% sehingga uji lanjut yang dipakai adalah Beda Nyata Jujur (BNJ), karena syaratnya adalah maksimal 5% pada kondisi homogen.

Uji lanjut BNJ 5 %

$$\begin{aligned} \text{BNJ}\alpha &= Q_{\alpha} \text{ (p : db Galat)} \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}} \\ &= Q_{5\%} (7 : 14) \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}} \\ &= 4,83 \times \sqrt{\frac{1,388}{3}} \\ &= 4,83 \times 0,68019605 = 3,29 \end{aligned}$$

Uji lanjut BNJ 1 %

$$\begin{aligned} \text{BNJ}_1\alpha &= Q_{\alpha} \text{ (p : db Galat)} \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}} \\ &= Q_{1\%} (7 : 14) \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}} \\ &= 5,88 \times \sqrt{\frac{1,388}{3}} \\ &= 5,88 \times 0,68019605 = 4 \end{aligned}$$

| Perlakuan                  | Rata-rata (%) | Notasi 5% | Notasi 1% |
|----------------------------|---------------|-----------|-----------|
| K (+)                      | 59,64         | a         | a         |
| P <sub>1</sub> 25 $\mu$ M  | 68,93         | b         | b         |
| P <sub>2</sub> 50 $\mu$ M  | 72,20         | bc        | bc        |
| P <sub>3</sub> 75 $\mu$ M  | 74,87         | c         | c         |
| P <sub>4</sub> 100 $\mu$ M | 79,89         | d         | d         |
| K (-)                      | 80,15         | d         | d         |
| P <sub>5</sub> 125 $\mu$ M | 81,44         | d         | d         |

Lampiran 7. Data Pengamatan Abnormalitas Kultur Primer Sel Paru-Paru Fetus Hamster setelah Perlakuan Vitamin E ( *$\alpha$ -tocoferol*) dan Pemaparan Etanol 10 mM selama 24 jam

| Perlakuan                    | Ulangan         | Jumlah sel hidup (sel normal dan sel abnormal dalam 5 kotak haemocytometer) |    |    |    |    |    |       | Abnormalitas sel (%) | Jumlah | Rata-rata |
|------------------------------|-----------------|---|----|----|----|----|----|-------|----------------------|--------|-----------|
|                              |                 | Sel hidup   | 1  | 2  | 3  | 4  | 5  | Total |                      |        |           |
| K (-)                        | 1               | Sel normal  | 9  | 7  | 9  | 10 | 12 | 47    | 12,96                | 42,42  | 14,14     |
|                              |                 | Sel abnormal  | 1  | 2  | 1  | 1  | 2  | 7     |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 54    | 14,71                |        |           |
|                              | 2               | Sel normal  | 16 | 6  | 17 | 8  | 11 | 58    |                      |        |           |
|                              |                 | Sel abnormal  | 1  | 3  | 2  | 3  | 1  | 10    |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 68    | 14,75                |        |           |
|                              | 3               | Sel normal  | 11 | 6  | 11 | 12 | 12 | 52    |                      |        |           |
|                              |                 | Sel abnormal  | 3  | 2  | 1  | 1  | 2  | 9     |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 61    |                      |        |           |
| K (+)                        | 1               | Sel normal  | 4  | 1  | 3  | 2  | 2  | 12    | 70                   | 180,98 | 60,33     |
|                              |                 | Sel abnormal  | 4  | 5  | 8  | 6  | 5  | 28    |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 40    | 60,98                |        |           |
|                              | 2               | Sel normal  | 5  | 1  | 5  | 1  | 4  | 16    |                      |        |           |
|                              |                 | Sel abnormal  | 3  | 4  | 6  | 7  | 5  | 25    |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 41    | 50                   |        |           |
|                              | 3               | Sel normal  | 7  | 6  | 4  | 1  | 5  | 23    |                      |        |           |
|                              |                 | Sel abnormal  | 5  | 5  | 3  | 6  | 4  | 23    |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 46    |                      |        |           |
| P <sub>1</sub><br>25 $\mu$ M | 1               | Sel normal  | 14 | 7  | 14 | 8  | 11 | 54    | 28                   | 98,99  | 32,99     |
|                              |                 | Sel abnormal  | 3  | 6  | 5  | 4  | 3  | 21    |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 75    | 40,43                |        |           |
|                              | 2               | Sel normal  | 7  | 9  | 1  | 5  | 6  | 28    |                      |        |           |
|                              |                 | Sel abnormal  | 4  | 3  | 5  | 3  | 4  | 19    |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 47    | 30,56                |        |           |
|                              | 3               | Sel normal  | 3  | 13 | 14 | 8  | 12 | 50    |                      |        |           |
|                              |                 | Sel abnormal  | 6  | 3  | 4  | 5  | 4  | 22    |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 72    |                      |        |           |
| P <sub>2</sub><br>50 $\mu$ M | 1               | Sel normal  | 6  | 11 | 14 | 12 | 12 | 55    | 26,67                | 74,59  | 24,86     |
|                              |                 | Sel abnormal  | 4  | 6  | 3  | 5  | 2  | 20    |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 75    | 21,95                |        |           |
|                              | 2               | Sel normal  | 12 | 19 | 10 | 10 | 13 | 64    |                      |        |           |
|                              |                 | Sel abnormal  | 4  | 3  | 5  | 4  | 2  | 18    |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 82    | 25,97                |        |           |
|                              | 3               | Sel normal  | 10 | 13 | 7  | 14 | 13 | 57    |                      |        |           |
|                              |                 | Sel abnormal  | 3  | 3  | 5  | 4  | 5  | 20    |                      |        |           |
|                              | Total sel hidup |   |    |    |    |    |    | 77    |                      |        |           |
|                              | 1               | Sel normal  | 16 | 9  | 20 | 14 | 18 | 77    |                      |        |           |

|                          |                 |              |    |    |    |    |    |     |       |       |       |
|--------------------------|-----------------|--------------|----|----|----|----|----|-----|-------|-------|-------|
| P <sub>3</sub><br>75 µM  |                 | Sel abnormal | 2  | 3  | 2  | 4  | 1  | 12  | 13,48 | 43,76 | 14,59 |
|                          | Total sel hidup |              |    |    |    |    |    |     | 89    |       |       |
|                          | 2               | Sel normal   | 16 | 17 | 13 | 18 | 13 | 77  | 16,3  |       |       |
|                          |                 | Sel abnormal | 2  | 3  | 4  | 2  | 4  | 15  |       |       |       |
|                          | Total sel hidup |              |    |    |    |    |    |     | 92    |       |       |
|                          | 3               | Sel normal   | 16 | 17 | 20 | 11 | 16 | 80  | 13,98 |       |       |
| Sel abnormal             |                 | 3            | 2  | 1  | 3  | 4  | 13 |     |       |       |       |
| Total sel hidup          |                 |              |    |    |    |    |    | 93  |       |       |       |
| P <sub>4</sub><br>100 µM | 1               | Sel normal   | 19 | 15 | 22 | 19 | 17 | 92  | 9,8   |       |       |
|                          |                 | Sel abnormal | 2  | 2  | 2  | 3  | 1  | 10  |       |       |       |
|                          | Total sel hidup |              |    |    |    |    |    |     | 102   |       |       |
|                          | 2               | Sel normal   | 20 | 17 | 20 | 18 | 20 | 95  | 9,52  |       |       |
|                          |                 | Sel abnormal | 3  | 3  | 2  | 1  | 1  | 10  |       |       |       |
|                          | Total sel hidup |              |    |    |    |    |    |     | 105   |       |       |
|                          | 3               | Sel normal   | 16 | 21 | 16 | 18 | 20 | 91  | 8,08  |       |       |
|                          |                 | Sel abnormal | 2  | 2  | 1  | 2  | 1  | 8   |       |       |       |
| Total sel hidup          |                 |              |    |    |    |    |    | 99  |       |       |       |
| P <sub>5</sub><br>125 µM | 1               | Sel normal   | 18 | 20 | 20 | 23 | 19 | 100 | 6,54  |       |       |
|                          |                 | Sel abnormal | 1  | 2  | 1  | 1  | 2  | 7   |       |       |       |
|                          | Total sel hidup |              |    |    |    |    |    |     | 107   |       |       |
|                          | 2               | Sel normal   | 18 | 23 | 19 | 26 | 18 | 104 | 7,14  |       |       |
|                          |                 | Sel abnormal | 2  | 1  | 1  | 2  | 2  | 8   |       |       |       |
|                          | Total sel hidup |              |    |    |    |    |    |     | 112   |       |       |
|                          | 3               | Sel normal   | 21 | 20 | 18 | 22 | 19 | 100 | 5,66  |       |       |
|                          |                 | Sel abnormal | 1  | 4  | 1  | 0  | 0  | 6   |       |       |       |
| Total sel hidup          |                 |              |    |    |    |    |    | 106 |       |       |       |

Lampiran 8. Analisis Statistik tentang Pengaruh Vitamin E (*α-tocoferol*) terhadap Abnormalitas Kultur Primer Sel Paru-Paru Fetus Hamster yang Dipapar Etanol

| Perlakuan             | Abnormalitas Sel (%) |       |       | Jumlah | Rata-rata |
|-----------------------|----------------------|-------|-------|--------|-----------|
|                       | Ulangan              |       |       |        |           |
|                       | 1                    | 2     | 3     |        |           |
| K (-)                 | 12,96                | 14,71 | 14,75 | 42,42  | 14,14     |
| K (+)                 | 70,00                | 60,98 | 50,00 | 180,98 | 60,33     |
| P <sub>1</sub> 25 μM  | 28,00                | 40,43 | 30,56 | 98,99  | 32,99     |
| P <sub>2</sub> 50 μM  | 26,67                | 21,95 | 25,97 | 74,59  | 24,86     |
| P <sub>3</sub> 75 μM  | 13,48                | 16,30 | 13,98 | 43,76  | 14,59     |
| P <sub>4</sub> 100 μM | 9,80                 | 9,52  | 8,08  | 27,40  | 9,23      |
| P <sub>5</sub> 125 μM | 6,54                 | 7,14  | 5,66  | 19,34  | 6,45      |
| Jumlah                |                      |       |       | 487,48 | 162,59    |

$$\bar{X} = \frac{487,48}{21} = 23,21$$

$$FK = \frac{487,48^2}{21} = \frac{237636,75}{21} = 11316,04$$

$$\begin{aligned} \text{JK Total Percobaan} &= 12,96^2 + 14,71^2 + 14,75^2 + 70^2 + 60,98^2 + 50^2 + 28^2 + \\ & 40,43^2 + 30,56^2 + 26,67^2 + 20,95^2 + 25,97^2 + 13,48^2 + \\ & 16,3^2 + 13,98^2 + 9,8^2 + 9,52^2 + 8,08^2 + 6,54^2 + 7,14^2 + \\ & 5,66^2 - FK \\ &= 167,9616 + 216,3841 + 217,5625 + 400 + 3718,5604 + \\ & 2500 + 784 + 1634,5849 + 933,9136 + 711,2889 + \\ & 481,8025 + 674,4409 + 181,7104 + 265,69 + 195,4404 + \\ & 96,04 + 90,6304 + 65,2864 + 42,7716 + 50,9796 + \\ & 32,0356 - FK \\ &= 17961,0838 - 11316,04 = 6645,04 \end{aligned}$$

$$\begin{aligned} \text{JK Perlakuan} &= \frac{42,42^2 + 60,33^2 + 32,99^2 + 24,86^2 + 14,59^2 + 9,23^2 + 6,45^2}{3} - FK \\ &= \frac{1799,4564 + 32753,7604 + 9799,0201 + 5563,6681}{3} \\ & \quad + \frac{1914,9376 + 750,76 + 374,0356}{3} - FK \\ &= \frac{52955,6382}{3} - 11316,04 \\ &= 17651,8794 - 11316,04 = 6335,84 \end{aligned}$$

$$\begin{aligned} \text{JK Galat} &= \text{JK Total Percobaan} - \text{JK Perlakuan} \\ &= 6645,04 - 6335,84 = 309,2 \end{aligned}$$

## ANAVA

| SK        | Db | JK      | KT      | F Hitung | F Tabel 5% | F Tabel 1% |
|-----------|----|---------|---------|----------|------------|------------|
| Perlakuan | 6  | 6335,84 | 1055,97 | 47,8     | 2,85       | 4,46       |
| Galat     | 14 | 309,20  | 22,09   |          |            |            |
| Total     | 20 |         |         |          |            |            |

F Hitung > F Tabel maka  $H_1$  diterima

Jadi ada perbedaan pengaruh pemberian vitamin E terhadap abnormalitas kultur primer sel paru-paru fetus hamster setelah dipapar etanol

$$\text{KK} = \frac{\sqrt{\text{KT Galat}}}{y \text{ (rerata)}} \times 100 = \frac{\sqrt{22,09}}{23,23} \times 100 = 20,23 = 20\%$$

KK bernilai 20% sehingga uji lanjut yang dipakai adalah Uji Duncan (UJD), karena syaratnya adalah minimal 10% pada kondisi homogen.

Karena ada 7 perlakuan maka nilai UJD ada 6 buah yaitu :

1. Membandingkan dua nilai tengah tanpa selingan nilai tengah lain

$$\text{UJD}\alpha = R\alpha_{(p : \text{db Galat})} \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}}$$

$$\begin{aligned} \text{UJD}_{5\%} &= R_{5\% (2 : 14)} \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}} \\ &= 3,03 \times \sqrt{\frac{22,09}{3}} \\ &= 3,03 \times 2,71 = 8,21 \end{aligned}$$

$$\begin{aligned} \text{UJD}_{1\%} &= R_{1\% (2 : 14)} \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}} \\ &= 4,21 \times \sqrt{\frac{22,09}{3}} \\ &= 4,21 \times 2,71 = 11,41 \end{aligned}$$

2. Membandingkan dua nilai tengah dengan satu selingan nilai tengah lain

$$\text{UJD}\alpha = R\alpha_{(p : \text{db Galat})} \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}}$$

$$\begin{aligned} \text{UJD}_{5\%} &= R_{5\% (3 : 14)} \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}} \\ &= 3,18 \times \sqrt{\frac{22,09}{3}} \\ &= 3,18 \times 2,71 = 8,62 \end{aligned}$$

$$\begin{aligned}
 UJD_{1\%} &= R_{1\% (3 : 14)} \times \sqrt{\frac{KT \text{ Galat}}{\text{Ulangan}}} \\
 &= 4,42 \times \sqrt{\frac{22,09}{3}} \\
 &= 4,42 \times 2,71 = 11,98
 \end{aligned}$$

3. Membandingkan dua nilai tengah dengan dua selingan nilai tengah lain

$$\begin{aligned}
 UJD_{\alpha} &= R_{\alpha (p : db \text{ Galat})} \times \sqrt{\frac{KT \text{ Galat}}{\text{Ulangan}}} \\
 UJD_{5\%} &= R_{5\% (4 : 14)} \times \sqrt{\frac{KT \text{ Galat}}{\text{Ulangan}}} \\
 &= 3,27 \times \sqrt{\frac{22,09}{3}} \\
 &= 3,27 \times 2,71 = 8,86
 \end{aligned}$$

$$\begin{aligned}
 UJD_{1\%} &= R_{1\% (4 : 14)} \times \sqrt{\frac{KT \text{ Galat}}{\text{Ulangan}}} \\
 &= 4,55 \times \sqrt{\frac{22,09}{3}} \\
 &= 4,55 \times 2,71 = 12,33
 \end{aligned}$$

4. Membandingkan dua nilai tengah dengan tiga selingan nilai tengah lain

$$\begin{aligned}
 UJD_{\alpha} &= R_{\alpha (p : db \text{ Galat})} \times \sqrt{\frac{KT \text{ Galat}}{\text{Ulangan}}} \\
 UJD_{5\%} &= R_{5\% (5 : 14)} \times \sqrt{\frac{KT \text{ Galat}}{\text{Ulangan}}} \\
 &= 3,33 \times \sqrt{\frac{22,09}{3}} \\
 &= 3,33 \times 2,71 = 9,02
 \end{aligned}$$

$$\begin{aligned}
 UJD_{1\%} &= R_{1\% (5 : 14)} \times \sqrt{\frac{KT \text{ Galat}}{\text{Ulangan}}} \\
 &= 4,63 \times \sqrt{\frac{22,09}{3}} \\
 &= 4,63 \times 2,71 = 12,55
 \end{aligned}$$

5. Membandingkan dua nilai tengah dengan empat selingan nilai tengah lain

$$\begin{aligned}
 UJD_{\alpha} &= R_{\alpha (p : db \text{ Galat})} \times \sqrt{\frac{KT \text{ Galat}}{\text{Ulangan}}} \\
 UJD_{5\%} &= R_{5\% (6 : 14)} \times \sqrt{\frac{KT \text{ Galat}}{\text{Ulangan}}} \\
 &= 3,37 \times \sqrt{\frac{22,09}{3}}
 \end{aligned}$$



$$= 3,37 \times 2,71 = 9,13$$

$$\begin{aligned} \text{UJD}_{1\%} &= R_{1\% (6 : 14)} \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}} \\ &= 4,70 \times \sqrt{\frac{22,09}{3}} \\ &= 4,70 \times 2,71 = 12,74 \end{aligned}$$

6. Membandingkan dua nilai tengah dengan empat selingan nilai tengah lain

$$\text{UJD}\alpha = R\alpha_{(p : db \text{ Galat})} \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}}$$

$$\begin{aligned} \text{UJD}_{5\%} &= R_{5\% (7 : 14)} \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}} \\ &= 3,39 \times \sqrt{\frac{22,09}{3}} \\ &= 3,39 \times 2,71 = 9,19 \end{aligned}$$

$$\begin{aligned} \text{UJD}_{1\%} &= R_{1\% (7 : 14)} \times \sqrt{\frac{\text{KT Galat}}{\text{Ulangan}}} \\ &= 4,78 \times \sqrt{\frac{22,09}{3}} \\ &= 4,78 \times 2,71 = 12,95 \end{aligned}$$

| Perlakuan             | Rata-rata (%) | Notasi 5% | Notasi 1% |
|-----------------------|---------------|-----------|-----------|
| P <sub>5</sub> 125 μM | 6,45          | a         | a         |
| P <sub>4</sub> 100 μM | 9,23          | a         | a         |
| K (-)                 | 14,14         | a         | a         |
| P <sub>3</sub> 75 μM  | 14,59         | a         | a         |
| P <sub>2</sub> 50 μM  | 24,86         | b         | a         |
| P <sub>1</sub> 25 μM  | 32,99         | b         | a         |
| K (+)                 | 60,33         | c         | b         |