

## DAFTAR PUSTAKA

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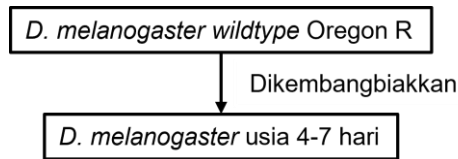
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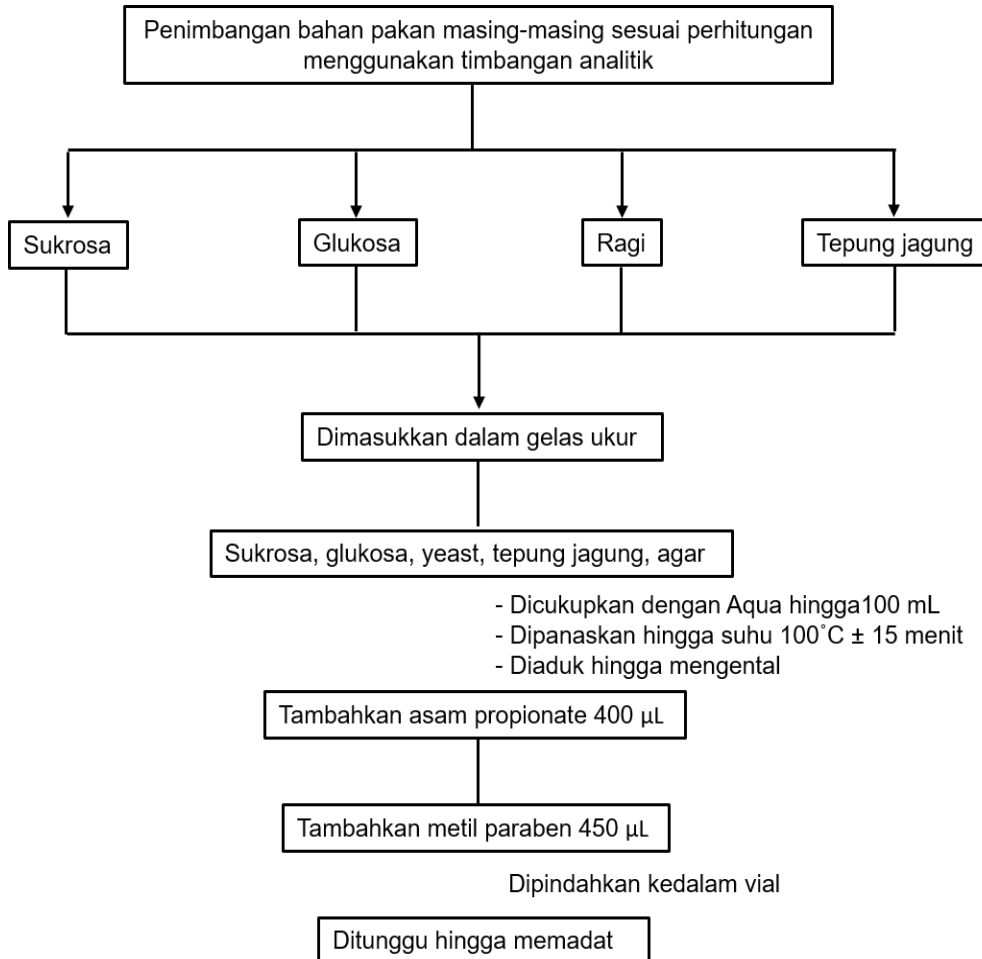
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## LAMPIRAN

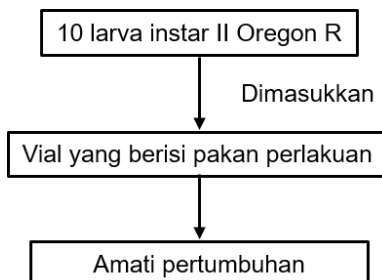
### Lampiran 1. Penyiapan Hewan Uji



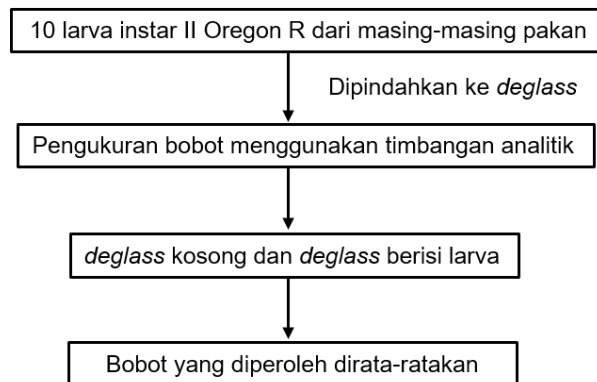
### Lampiran 2. Pembuatan Pakan



### Lampiran 3. Uji Perkembangan



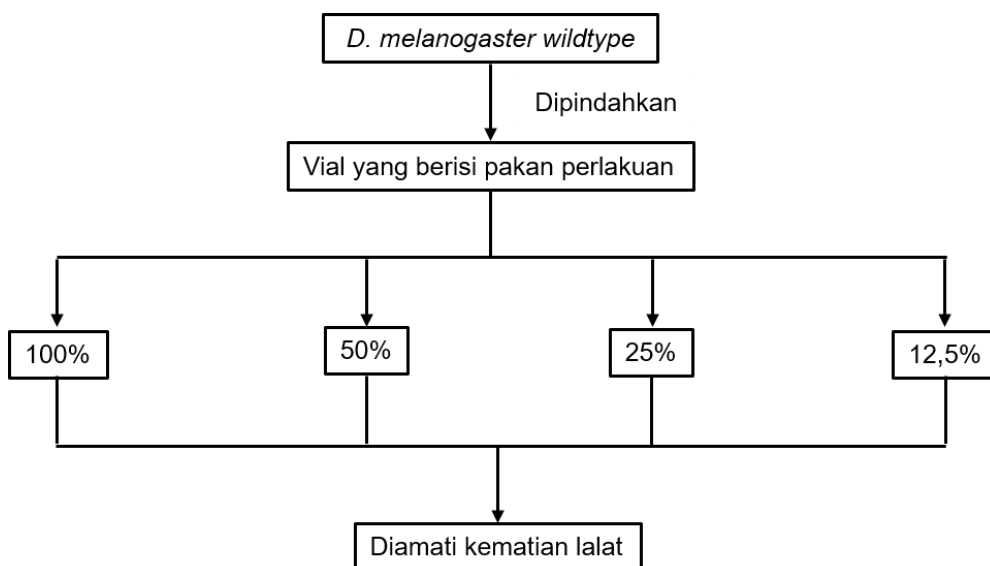
#### Lampiran 4. Uji Pengukuran Bobot



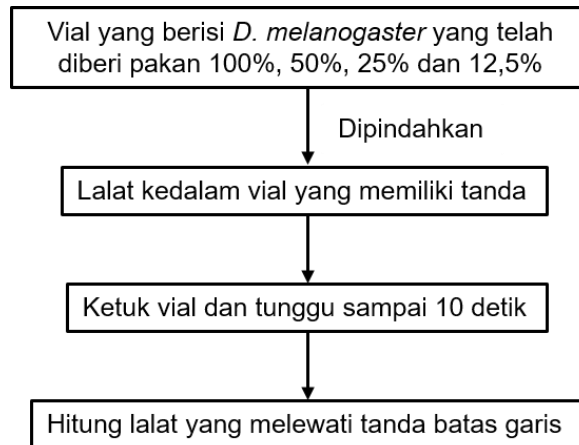
#### Lampiran 5. Uji Pengukuran Panjang dan Lebar



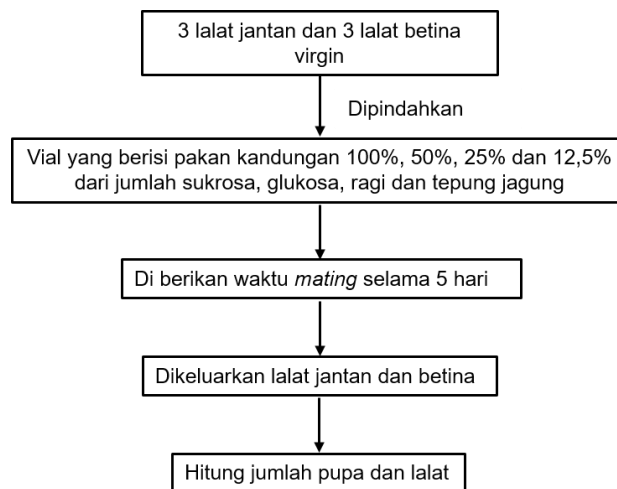
#### Lampiran 6. Uji Survival Lalat Dewasa



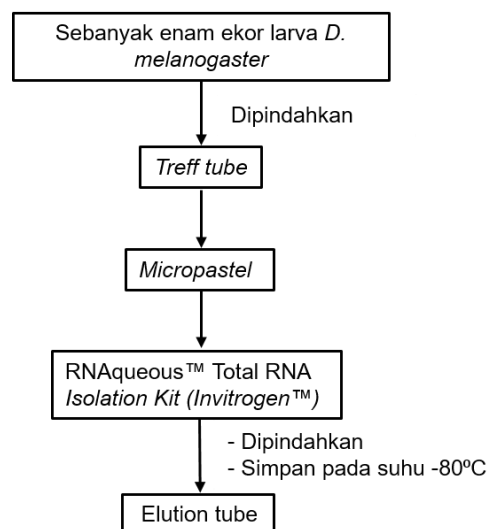
### Lampiran 7. Uji Lokomotor Lalat Dewasa



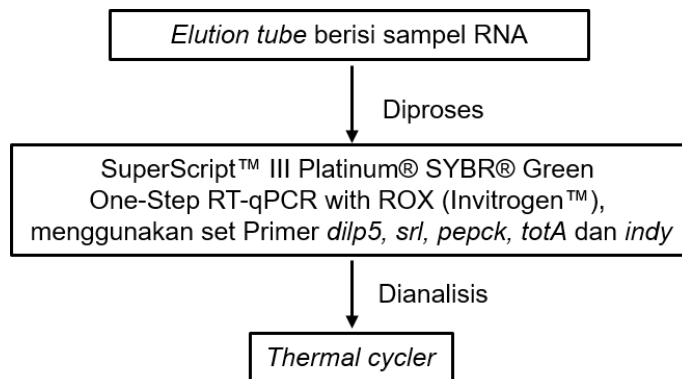
### Lampiran 8. Uji Reproduksi



### Lampiran 9. Isolasi RNA



### Lampiran 10. Running PCR



### Lampiran 11. Perhitungan kandungan pakan *D. melanogaster*

- Pakan Normal dalam 100 mL mengandung:

Sukrosa	= 3 g	Agar	= 1,5 g
Glukosa	= 6 g	Asam propionate	= 400 $\mu$ L
Ragi	= 1,25 g	Metil paraben	= 450 $\mu$ L
Tepung jagung	= 5 g	Aqua ad	100 mL

- Pakan kandungan 50%

Sukrosa	= $\frac{50}{100} \times 3 \text{ g} = 1,5 \text{ g}$	Glukosa	= $\frac{50}{100} \times 6 \text{ g} = 3 \text{ g}$
Ragi	= $\frac{50}{100} \times 1,25 \text{ g} = 0,625 \text{ g}$	Tepung jagung	= $\frac{50}{100} \times 5 \text{ g} = 2,5 \text{ g}$

- Pakan kandungan 25%

Sukrosa	= $\frac{25}{100} \times 3 \text{ g} = 0,75 \text{ g}$	Glukosa	= $\frac{25}{100} \times 6 \text{ g} = 1,5 \text{ g}$
Ragi	= $\frac{25}{100} \times 1,25 \text{ g} = 0,3125 \text{ g}$	Tepung jagung	= $\frac{25}{100} \times 5 \text{ g} = 1,25 \text{ g}$

- Pakan kandungan 12,5%

Sukrosa	= $\frac{12,5}{100} \times 3 \text{ g} = 0,375 \text{ g}$	Glukosa	= $\frac{12,5}{100} \times 6 \text{ g} = 0,75 \text{ g}$
Ragi	= $\frac{12,5}{100} \times 1,25 \text{ g} = 0,15625 \text{ g}$	Tepung jagung	= $\frac{12,5}{100} \times 5 \text{ g} = 0,625 \text{ g}$

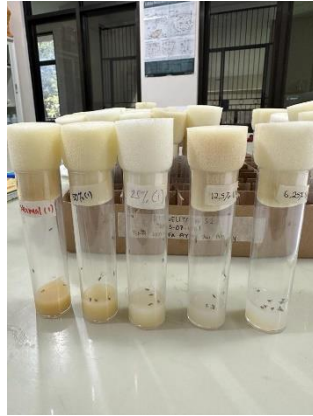


**Lampiran 12. Gambar Penelitian**

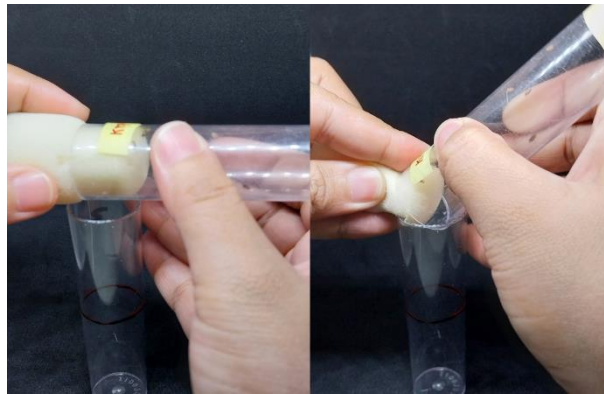
**Gambar 9.** Penyiapan pembuatan pakan kandungan 100%, 50%, 25% dan 12,5% dari jumlah sukrosa, glukosa, ragi dan tepung jagung.



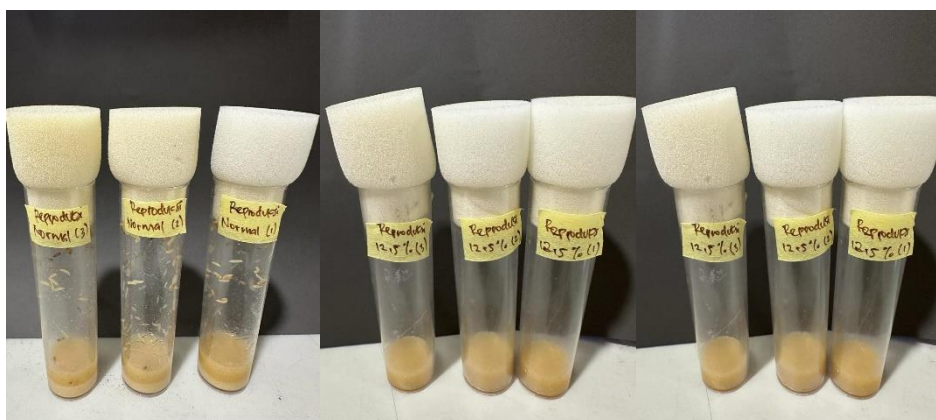
**Gambar 10.** Uji Pengukuran bobot dan panjang larva *Drosophila*



**Gambar 11.** Uji perkembangan larva *Drosophila* menjadi pupa hingga menjadi lalat dewasa, dilanjutkan pengujian survival pada lalat dewasa.



**Gambar 12.** Uji lokomotor dengan metode geotaksis negatif pada lalat dewasa.



**Gambar 13.** Uji reproduksi kandungan pakan 100%, 50%, 25% dan 12,5% dari jumlah sukrosa, glukosa, ragi dan tepung jagung.



**Gambar 14.** Penyiapan isolasi dan analisis ekspresi gen *dilp5*, *srl*, *pepck*, *totA* dan *indy*

### Lampiran 13. Analisis statistik

**Tabel 4.** Hasil perbandingan tukey uji perkembangan larva menjadi pupa pada pakan yang mengandung sukrosa, glukosa, ragi dan tepung jagung.

Tukey's multiple comparisons test	Mean Diff,	95,00% CI of diff,	Summary	Adjusted P Value
100% vs. 50%	8	-10,98 to 26,98	ns	0,632
100% vs. 25%	40	21,02 to 58,98	***	<0,0001
100% vs. 12,5%	88	69,02 to 107,0	****	<0,0001
50% vs. 25%	32	13,02 to 50,98	***	0,001
50% vs. 12,5%	80	61,02 to 98,98	****	<0,0001
25% vs. 12,5%	48	29,02 to 66,98	****	<0,0001

**Tabel 5.** Hasil perbandingan tukey uji perkembangan pupa menjadi lalat dewasa pada pakan yang mengandung sukrosa, glukosa, ragi dan tepung jagung.

Tukey's multiple comparisons test	Mean Diff,	95,00% CI of diff,	Summary	Adjusted P Value
100% vs. 50%	2	-19,98 to 23,98	ns	0,9936
100% vs. 25%	42	20,02 to 63,98	***	0,0003
100% vs. 12,5%	80	58,02 to 102,0	****	<0,0001
50% vs. 25%	40	18,02 to 61,98	***	0,0005
50% vs. 12,5%	78	56,02 to 99,98	****	<0,0001
25% vs. 12,5%	38	16,02 to 59,98	***	0,0008

**Tabel 6.** Hasil perbandingan tukey uji pengukuran bobot larva pada pakan yang mengandung sukrosa, glukosa, ragi dan tepung jagung.

Tukey's multiple comparisons test	Mean Diff,	95,00% CI of diff,	Summary	Adjusted P Value
100% vs. 50%	2,327	1,798 to 2,856	****	<0,0001
100% vs. 25%	2,69	2,161 to 3,219	****	<0,0001
100% vs. 12,5%	2,77	2,241 to 3,299	****	<0,0001
50% vs. 25%	0,3633	-0,1658 to 0,8924	ns	0,2031
50% vs. 12,5%	0,4433	-0,08578 to 0,9724	ns	0,104
25% vs. 12,5%	0,08	-0,4491 to 0,6091	ns	0,9605

**Tabel 7.** Hasil perbandingan pengukuran panjang larva pada pakan yang mengandung sukrosa, glukosa, ragi dan tepung jagung.

Tukey's multiple comparisons test	Mean Diff,	95,00% CI of diff,	Summary	Adjusted P Value
100% vs. 50%	3,833	-0,1232 to 7,790	ns	0,0561
100% vs. 25%	11,69	6,849 to 16,53	**	0,0011
100% vs. 12,5%	16,20	13,42 to 18,99	****	<0,0001
50% vs. 25%	7,855	3,828 to 11,88	**	0,0031
50% vs. 12,5%	12,37	7,313 to 17,42	**	0,0011
25% vs. 12,5%	4,513	-0,03139 to 9,058	ns	0,0513

**Tabel 8.** Hasil perbandingan pengukuran lebar larva pada pakan yang mengandung sukrosa, glukosa, ragi dan tepung jagung.

Tukey's multiple comparisons test	Mean Diff,	95,00% CI of diff,	Summary	Adjusted P Value
100% vs. 50%	2,423	0,06749 to 4,779	*	0,0451
100% vs. 25%	4,125	1,869 to 6,381	**	0,0041
100% vs. 12,5%	4,585	2,785 to 6,385	***	0,0009
50% vs. 25%	1,702	0,8220 to 2,581	**	0,0032
50% vs. 12,5%	2,162	1,243 to 3,080	**	0,0013
25% vs. 12,5%	0,4600	-0,4088 to 1,329	ns	0,3157

**Tabel 9.** Hasil perbandingan lokomotor pada pakan yang mengandung sukrosa, glukosa, ragi dan tepung jagung.

Tukey's multiple comparisons test	Predicted (LS) mean diff	95,00% CI of diff,	Summary	Adjusted P Value
<b>Hari-1</b>				
100%vs. 50%	2,235	-8,814 to 13,28	ns	0,8775
100% vs. 25%	5,180	-6,466 to 16,83	ns	0,5355
50% vs. 25%	2,945	-8,104 to 13,99	ns	0,7974
<b>Hari-3</b>				
100% vs. 50%	7,410	-3,007 to 17,83	ns	0,2092
100% vs. 25%	8,597	-3,432 to 20,63	ns	0,2062
50% vs. 25%	1,187	-10,84 to 13,22	ns	0,9693
<b>Hari-6</b>				
100% vs. 50%	9,174	-1,243 to 19,59	ns	0,0948
100% vs. 25%	8,371	-3,657 to 20,40	ns	0,2232
50% vs. 25%	-0,8027	-12,83 to 11,23	ns	0,9858
<b>Hari-9</b>				
100% vs. 50%	0,2900	-10,13 to 10,71	ns	0,9975
100% vs. 25%	-2,223	-16,00 to 11,56	ns	0,9202
50% vs. 25%	-2,513	-16,29 to 11,27	ns	0,8992
<b>Hari-12</b>				
100% vs. 50%	4,076	-6,973 to 15,12	ns	0,6495
100% vs. 25%	4,196	-7,832 to 16,22	ns	0,6796
100% vs. 25%	0,1200	-12,46 to 12,70	ns	0,9997
<b>Hari-15</b>				
100% vs. 50%	9,258	-4,522 to 23,04	ns	0,2464
100% vs. 25%	87,59	73,81 to 101,4	****	<0,0001
50% vs. 25%	78,33	61,86 to 94,80	****	<0,0001

**Tabel 10.** Hasil perbandingan reproduksi pada pakan kekurangan nutrisi kandungan 100%, 50%, 25% dan 12,5%

Tukey's multiple comparisons test	Mean Diff,	95,00% CI of diff,	Summary	Adjusted P Value
100% vs. 50%	11,00	-15,80 to 37,80	ns	0,5798
100% vs. 25%	53,00	26,20 to 79,80	**	0,0010
100% vs. 12,5%	64,33	37,53 to 91,14	***	0,0003
50% vs. 25%	42,00	15,20 to 68,80	**	0,0045
50% vs. 12,5%	53,33	26,53 to 80,14	***	0,0010
25% vs. 12,5%	11,33	-15,47 to 38,14	ns	0,5579

**Tabel 11.** Hasil perbandingan ekspresi gen *dilp5* pada pakan yang mengandung sukrosa, glukosa, ragi dan tepung jagung.

Tukey's multiple comparisons test	Mean Diff,	95,00% CI of diff,	Summary	Adjusted P Value
100% vs. 50%	-0,03275	-0,1180 to 0,05255	ns	0,4851
100% vs. 25%	-0,1633	-0,2485 to -0,07795	**	0,0051
100% vs. 12,5%	-0,1623	-0,2475 to -0,07695	**	0,0052
50% vs. 25%	-0,1305	-0,2158 to -0,04520	*	0,0116
50% vs. 12,5%	-0,1295	-0,2148 to -0,04420	*	0,0119
25% vs. 12,5%	0,001000	-0,08430 to 0,08630	ns	>0,9999

**Tabel 12.** Hasil perbandingan ekspresi gen *srI* pada pakan yang mengandung sukrosa, glukosa, ragi dan tepung jagung.

Tukey's multiple comparisons test	Mean Diff,	95,00% CI of diff,	Summary	Adjusted P Value
100% vs. 50%	-0,01750	-0,3170 to 0,2820	ns	0,5798
100% vs. 25%	-0,3070	-0,6065 to -0,007543	**	0,0010
100% vs. 12,5%	-0,3985	-0,6980 to -0,09904	***	0,0003
50% vs. 25%	-0,2895	-0,5890 to 0,009957	**	0,0045
50% vs. 12,5%	-0,3810	-0,6805 to -0,08154	***	0,0010
25% vs. 12,5%	-0,09150	-0,3910 to 0,2080	ns	0,5579

**Tabel 13.** Hasil perbandingan ekspresi gen *pepck* pada pakan yang mengandung sukrosa, glukosa, ragi dan tepung jagung.

Tukey's multiple comparisons test	Mean Diff,	95,00% CI of diff,	Summary	Adjusted P Value
100% vs. 50%	-0,2550	-0,9965 to 0,4865	ns	0,5596
100% vs. 25%	0,01000	-0,7315 to 0,7515	ns	>0,9999
100% vs. 12,5%	-0,1350	-0,8765 to 0,6065	ns	0,8762
50% vs. 25%	0,2650	-0,4765 to 1,006	ns	0,5338
50% vs. 12,5%	0,1200	-0,6215 to 0,8615	ns	0,9073
25% vs. 12,5%	-0,1450	-0,8865 to 0,5965	ns	0,8535

**Tabel 14.** Hasil perbandingan ekspresi gen *totA* pada pakan yang mengandung sukrosa, glukosa, ragi dan tepung jagung.

Tukey's multiple comparisons test	Mean Diff,	95,00% CI of diff,	Summary	Adjusted P Value
100% vs 50%	0,1450	-0,06964 to 0,3596	ns	0,1568
100% vs. 25%	1,257	1,042 to 1,472	****	<0,0001
100% vs. 12,5%	1,270	1,055 to 1,484	****	<0,0001
50% vs. 25%	1,112	0,8974 to 1,327	***	0,0001
50% vs. 12,5%	1,125	0,9099 to 1,339	***	0,0001
25% vs. 12,5%	0,01250	-0,2021 to 0,2271	ns	0,9946

**Tabel 15.** Hasil perbandingan ekspresi gen *indy* pada pakan yang mengandung sukrosa, glukosa, ragi dan tepung jagung.

Tukey's multiple comparisons test	Mean Diff,	95,00% CI of diff,	Summary	Adjusted P Value
100% vs. 50%	-0,08650	-0,2292 to 0,05623	ns	0,2051
100% vs. 25%	-0,1965	-0,3392 to -0,05377	*	0,0169
100% vs. 12,5%	-0,1980	-0,3407 to -0,05527	*	0,0165
50% vs. 25%	-0,1100	-0,2527 to 0,03273	ns	0,1099
50% vs 12,5%	-0,1115	-0,2542 to 0,03123	ns	0,1057
25% vs. 12,5%	-	-0,1442 to 0,1412	ns	>0,9999

### Lampiran 13. Komposisi Pakan

#### 1. Komposisi Tepung jagung tiap 100 gram:

- Kalori : 345kal
- Lemak total : 2 g (3%)
- Karbohidrat : 76,5 g (26,1%)
- Protein : 9,1 g
- Vitamin a : 0,1 mg (0,15%)
- Vitamin b : 3,7 mg (0,03%)
- Kalsium : 14 mg (0,21%)
- Zat besi : 3,7 mg (0,05%)
- Fosfor : 311 mg (0,46%)

#### 2. Komposisi Ragi tiap 30 gram:

- Lemak : 1 g (1%)
- Kolesterol : 0 g (0%)
- Natrium : 20 mg (1%)
- Karbohidrat : 13 g (5%)
- Protein : 14 g (28%)
- Kalsium : 84 mg (6%)
- Zat besi : 2 mg (10%)
- Kalium : 540 mg (10%)