

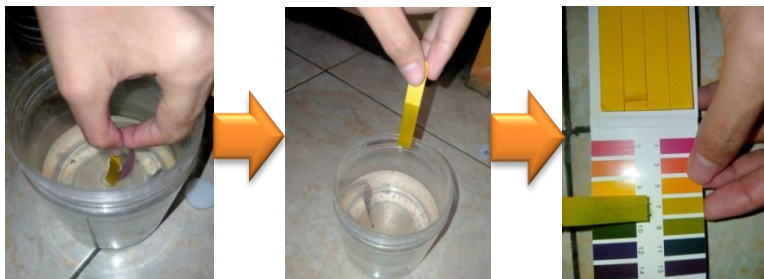
LAMPIRAN

Lampiran 1. Dokumentasi Penelitian

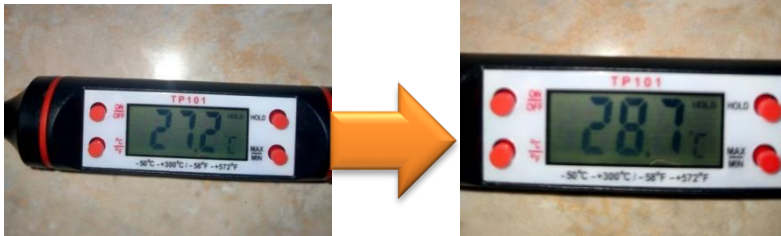




Dokumentasi 1. Peralatan dan Bahan Penelitian



Dokumentasi 2. Pengukuran PH Air




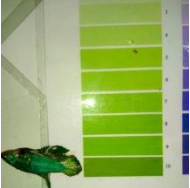





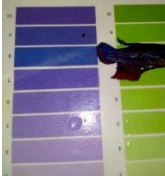


Dokumentasi 3. Pengukuran Suhu Air














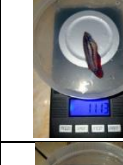




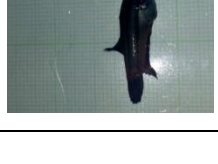
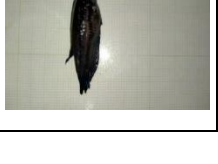
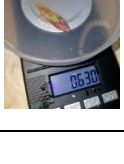

Dokumentasi 4. Penakaran Pellet + Tepung Labu Kuning Untuk Pakan Ikan Cupang



Dokumentasi 5. Pemeliharaan Ikan Cupang Sesuai Tiap Perlakuan

Perlakuan	Perubahan Warna Ikan Cupang	
	Awal	Akhir
PP ₀ P ₀		
P ₁		
P ₂		
P ₃		
P ₄		

Dokumentasi 6. Peningkatan warna ikan cupang setiap perlakuan

Perlakuan	Peningkatan Pertumbuhan Panjang dan Berat Ikan Cupang			
	Panjang (Awal)	Panjang (Akhir)	Berat (Awal)	Berat (Akhir)
P ₀				
P ₁				
P ₂				
P ₃				
P ₄				

Dokumentasi 7. Peningkatan pertumbuhan ikan cupang setiap perlakuan

Lampiran 2. Data Peningkatan Warna Ikan Cupang Setiap Perlakuan

Perlakuan	Ulangan	Pengamatan Perubahan Warna	
		Awal	Akhir
P0 (Kontrol) 5 % Pellet	1	1	9
	2	0	8
	3	1	10
Jumlah		2	27
Rata-Rata		0,66	9
Perubahan		0	8,34
P1 2,5% TLK 5 % Pellet	1	0	9
	2	0	12
	3	1	8
Jumlah		1	29
Rata-Rata		0,33	10
Perubahan		0	9,67
P2 5 % TLK 5 % Pellet	1	0	9
	2	0	8
	3	0	14
Jumlah		0	31
Rata-Rata		0	10,33
Perubahan		0	10,33
P3 7,5 % TLK 5 % Pellet	1	1	8
	2	1	9
	3	0	15
Jumlah		2	32
Rata-Rata		0,66	10,66
Perubahan		0	10
P4 10 % TLK 5 % Pellet	1	0	9
	2	0	15
	3	1	10
Jumlah		1	34
Rata-Rata		0,33	11,33
Perubahan		0	11

Lampiran 3. Data Peningkatan Pertumbuhan Ikan Cupang Setiap Perlakuan

Perlakuan	Ulangan	Pengukuran Awal		Pengukuran Akhir	
		Panjang (mm)	Berat (gram)	Panjang (mm)	Berat (gram)
P0 (Kontrol) 5% Pellet	1	25	0,31	43	0,388
	2	34	0,166	44	0,323
	3	37	0,563	47	0,58
Jumlah		96	1,039	134	1,291
Rata-Rata		48	0,34	44	0,43
Perubahan		0	0	7,33	0,09
P1 2,5% TLK 5 % Pellet	1	31	0,352	43	0,476
	2	31	0,28	44	0,958
	3	31	0,382	45	0,726
Jumlah		93	1,014	132	2,16
Rata-Rata		31	0,33	44	0,72
Perubahan		0	0	7	0,39
P2 5 % TLK 5 % Pellet	1	30	1,07	40	1,506
	2	30	0,433	48	1,024
	3	29	0,195	39	1,113
Jumlah			1,698	127	3,643
Rata-Rata			0,56	42,33	1,21
Perubahan			0	12,33	0,65
P3 7,5 % TLK 5 % Pellet	1	31	0,478	47	0,58
	2	25	0,253	45	0,286
	3	27	0,386	48	0,972
Jumlah		83	1,117	140	1,838
Rata-Rata		27,66	0,37	46	1,21
Perubahan		0	0	18,34	0,24
P4 10 % TLK 5 % Pellet	1	33	0,63	43	1,7 24
	2	26	0,272	36	0,812
	3	29	0,332	47	1,081
Jumlah		88	1,234	126	3,617
Rata-Rata		30	0,41	42	1,2
Perubahan		0	0	12	79

Lampiran 4. Data Kualitas Air

SUHU

Perlakuan	Ulangan	Perubahan suhu (°C)												Rata-Rata	Total Rata-Rata
		(Diukur selama 1 bulan dengan penggantian air 12 kali)													
		1	2	3	4	5	6	7	8	9	10	11	12		
P ₁	1	27,2	27	27,2	27,2	27,2	28	27	27	27,5	27,2	27	28	27	27,06
	2	27	27	28	27,5	27,2	27,2	27	28	27	27	26,5	27	27,2	
	3	27	28	26	27,2	27,2	27,2	27,2	27,2	27	27,2	27	27	27	
P ₂	1	27	27	27	27	28	27,5	28	27	26,5	27,5	26,5	27,2	27	26,66
	2	27,2	27,5	27	26	27,5	27,5	27,5	27,5	27	28	27	28	27	
	3	28	27,2	27	26	27	27	28	7,5	27,5	27,5	27,2	27,5	26	
P ₃	1	27	27	27	27	27,5	27	27	27,5	27,5	27	26	28	27	27,1
	2	27,2	27,2	26	27,5	27,5	27,5	27,5	27,5	26,5	27,5	27,5	27	27,2	
	3	27,2	28	27	26	27	27	28	27	27	27	27	27	27,1	
P ₄	1	27	27	26	27	27,2	27,2	27,2	27,2	26,2	27	27	27,5	26	26,33
	2	27,5	27,5	27,5	27,5	27,5	27,2	27,5	27	27,5	27	27	27	27	
	3	26	27,5	27	27,2	26,5	26,5	28	28	26	27	27,2	27	26	
P ₅	1	26	26,5	27	27	27	26	27	28	27,2	27,2	26	27,2	26	26,66
	2	26,2	26,2	27,2	27,2	27,2	27,2	27,2	27,2	27,2	27,2	26,5	27	27	
	3	26	26	27,2	27	27	27	27	27	27,5	27,5	26	27	27	

PH

Perlakuan	Ulangan	Perubahan PH (Diukur selama 1 bulan dengan penggantian air 12 kali)												Rata-Rata	Total Rata-Rata	
		1	2	3	4	5	6	7	8	9	10	11	12			
P ₀	1	7	7	6,5	7	7	6,5	7	7	7	7	7	7	7	7	7
	2	7	7	7	7	7	7	7	6,5	6,5	7	6,5	7	7	7	
	3	7	7	6,5	7	7	7	7	7	6,5	7	7	7	7	7	
P ₁	1	7	7	7	7	7	6,5	7	7	6,5	7	6,5	7	7	7	7
	2	6,5	7	7	6,5	7	7	7	7	7	7	7	7	7	7	
	3	6,5	7	7	6,5	7	7	7	7	7	7	6,5	7	7	7	
P ₂	1	7	7	7	7	7	7	7	6,5	7	7	7	7	7	7	7
	2	7	7	7	7	7	7	7	6,5	6,5	7	7	7	7	7	
	3	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
P ₃	1	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	2	7	6,5	7	6,5	7	7	7	7	6,5	7	7	7	7	7	
	3	6,5	6,5	7	7	7	7	7	7	6,5	7	7	7	7	7	
P ₄	1	7	6,5	7	7	7	7	7	7	7	7	6,5	7	7	7	7
	2	6,5	6,5	7	7	7	6,5	7	7	7	7	6,5	7	7	7	
	3	6,5	7	7	7	7	7	7	7	6,5	7	6,5	7	7	7	

Lampiran 5. Data Statistik Uji Normalitas dan Homogenitas, ANSIRA, dan Uji Lanjut (Duncan) Peningkatan Warna Pada Ikan Cupang

uan	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.

efors Significance Correction

	Tests of Homogeneity of Variances			
	Levene Statistic	df1	df2	Sig.
on Mean				
on Median				
on Median and with adjust				
on trimmed mean				

```

UNIANOVA Warna BY Perlakuan
/METHOD=SSTYPE(3)
/INTERCEPT=INCLUDE
/POSTHOC=Perlakuan(DUNCAN LSD)
/PLOT=PROFILE(Perlakuan) TYPE=LINE ERRORBAR=NO MEANREFERENCE=NO
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/PRINT HOMOGENEITY
CRITERIA=ALPHA(.05)
/DESIGN=Perlakuan.
    
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Univariate Analysis of Variance

Between-Subjects Factors

	Value Label	N
Warna		

Levene's Test of Equality of Error Variances^{a,b}

	Levene Statistic	df1	df2	Sig.
Warna on Mean				
Warna on Median				
Warna on Median and with adjusted df				
Warna on trimmed mean				

a. The null hypothesis that the error variance of the dependent variable is equal across groups.

b. Dependent Variable: Warna

c. Design: Intercept + Perlakuan

Tests of Between-Subjects Effects

Dependent Variable: Warna

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model					
Intercept	15		15	1	
Warna					
Total	16				
Corrected Total					

R Squared = .108 (Adjusted R Squared = -.249)

Homogeneous Subsets

		Warna	
		uan	N
		Subset	
n ^{a,b}		1	
			1
			1
			1

for groups in homogeneous subsets are displayed.

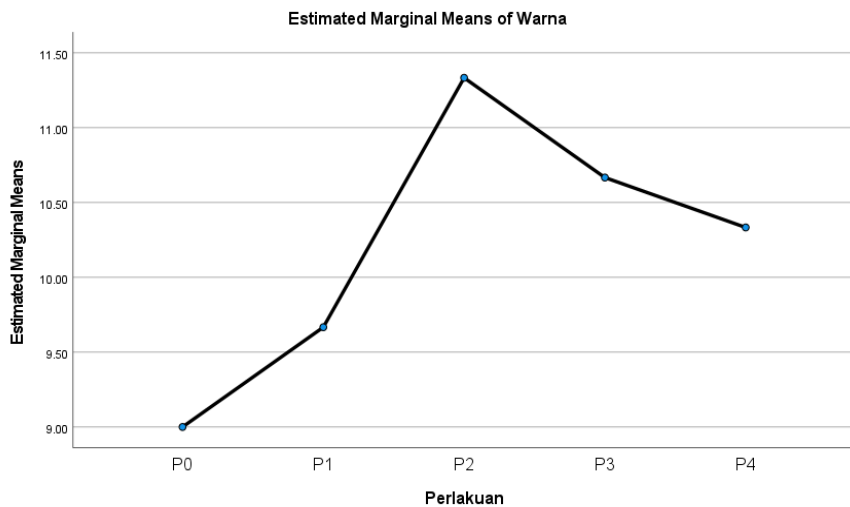
on observed means.

ror term is Mean Square(Error) = 8.067.

s Harmonic Mean Sample Size = 3.000.

α = ,05.

Profile Plots



Lampiran 6. Data Statistik Uji Normalitas dan Homogenitas, ANSIRA, dan Uji Lanjut (Duncan) Peningkatan Panjang Pada Ikan Cupang

		Tests of Normality					
		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
uan		Statistic	df	Sig.	Statistic	df	Sig.
0.05							

efors Significance Correction

		Tests of Homogeneity of Variances			
		Levene Statistic	df1	df2	Sig.
0.05	on Mean				
	on Median				
	on Median and with sd df				
	on trimmed mean				

```

UNIANOVA Panjang BY Perlakuan
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/PRINT HOMOGENEITY
/CRITERIA=ALPHA(.05)
/DESIGN=Perlakuan.
    
```

Univariate Analysis of Variance

Between-Subjects Factors		
	Value Label	N
Kategori		

Levene's Test of Equality of Error Variances ^{a,b}					
		Levene Statistic	df1	df2	Sig.
Kategori	on Mean				
	on Median				
	on Median and with adjusted				
	on trimmed mean				

The null hypothesis that the error variance of the dependent variable is equal across groups.

Dependent Variable: Panjang

Design: Intercept + Perlakuan

Tests of Between-Subjects Effects					
Dependent Variable: Panjang					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	289	1	289	22	
Corrected Total	291	1			

R Squared = .254 (Adjusted R Squared = -.044)

Homogeneous Subsets

Panjang			Subset
uan	N		1
n ^{a,b}			4
			4
			4
			4
			4
			4

for groups in homogeneous subsets are displayed.

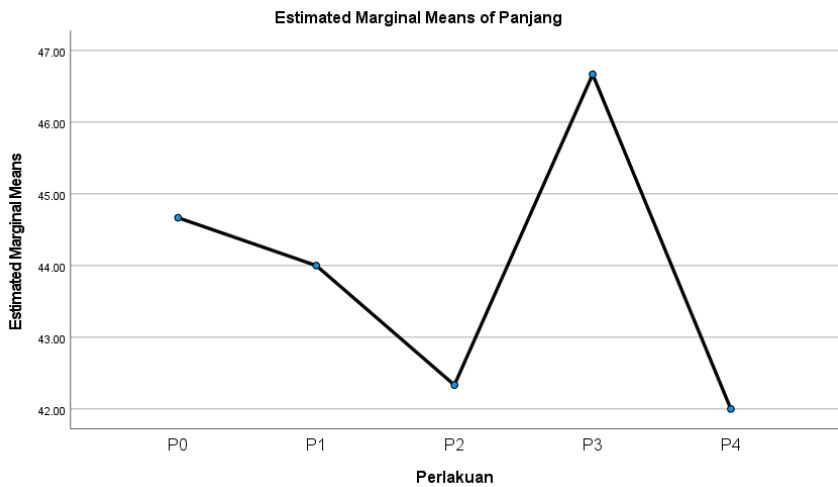
on observed means.

ror term is Mean Square(Error) = 12.600.

s Harmonic Mean Sample Size = 3.000.

α = .05.

Profile Plots



Lampiran 7. Data Statistik Uji Normalitas dan Homogenitas, ANSIRA, dan Uji Lanjut (Duncan) Peningkatan Berat Pada Ikan Cupang

uan	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.

efors Significance Correction

	Tests of Homogeneity of Variances			
	Levene Statistic	df1	df2	Sig.
on Mean				
on Median				
on Median and with adj				
on trimmed mean				

```

UNIANOVA Berat BY Perlakuan
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/PRINT HOMOGENEITY
/CRITERIA=ALPHA(.05)
/DESIGN=Perlakuan.
    
```

Univariate Analysis of Variance

Between-Subjects Factors		
	Value Label	N
uan		

Levene's Test of Equality of Error Variances ^{a,b}				
	Levene Statistic	df1	df2	Sig.
on Mean				
on Median				
on Median and with adjusted c				
on trimmed mean				

he null hypothesis that the error variance of the dependent variable is equal across groups.

endent variable: Berat

ign: Intercept + Perlakuan

Tests of Between-Subjects Effects					
dent Variable: Berat					
	Type III Sum of Squares	df	Mean Square	F	Sig.
ted Model					
pt				1	
uan					
ted Total					

quared = .614 (Adjusted R Squared = .460)

Homogeneous Subsets

		Berat	
uan	N	1	2
n ^{a,b}			

for groups in homogeneous subsets are displayed.

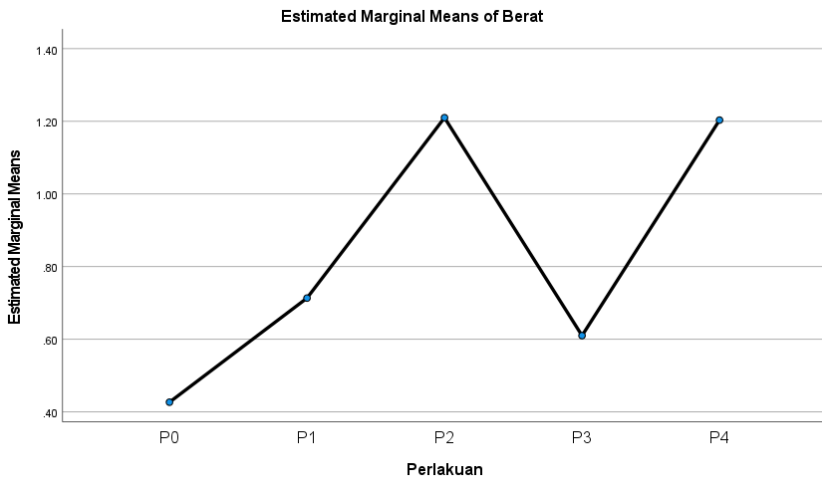
on observed means.

ror term is Mean Square(Error) = .096.

s Harmonic Mean Sample Size = 3.000.

1a = ,05.

Profile Plots



Lampiran 8. Perhitungan Pemberian Pakan Ikan Cupang Sesuai Perlakuan

Berat Ikan \times Jumlah Ikan \times Presentase Pakan

$$P_0 \text{ (Kontrol)} = \text{Berat Ikan} = 0,166$$

$$\text{Jumlah Ikan} = 1 \text{ ekor}$$

$$\begin{aligned} \text{Presentase Pakan} &= 5\% \times 0,166 \text{ gram} \times 1 \\ &= 0,0083 \end{aligned}$$

$$P_1 \text{ (2,5\%)} = \text{Berat Ikan} = 0,280$$

$$\text{Jumlah Ikan} = 1 \text{ ekor}$$

$$\begin{aligned} \text{Presentase Pakan} &= 5\% \times 0,280 \text{ gram} \times 1 \\ &= 0,014 \end{aligned}$$

$$\begin{aligned} \text{T. Labu Kuning (2,5\%)} &= \frac{2,5}{100} \times 0,014 \text{ g} \\ &= 0,00035 \text{ gram (1 kali makan)} \end{aligned}$$

$$\begin{aligned} \text{Kandungan beta-karoten} &= 17,25 \text{ mg / 100 gram} \\ &= \frac{17,25}{100} \times 0,00035 \text{ gram} = 0,00006 \text{ mg} \end{aligned}$$

$$\begin{aligned} \text{Kandungan Protein 9,65 \%} &= 9.650 \text{ mg / 100 gram} \\ &= \frac{9.650}{100} \times 0,00035 \text{ gram} = 0,03 \text{ \%} \end{aligned}$$

$$P_2 (5\%) = \text{Berat Ikan} = 0,433$$

$$\text{Jumlah Ikan} = 1 \text{ ekor}$$

$$\begin{aligned} \text{Presentase Pakan} &= 5\% \times 0,433 \text{ gram} \times 1 \\ &= 0,021 \end{aligned}$$

$$\text{T. Labu Kuning (5\%)} = \frac{5}{100} \times 0,021 \text{ g}$$

$$= 0,00105 \text{ gram (1 kali makan)}$$

$$\text{Kandungan beta-karoten} = 17,25 \text{ mg / 100 gram}$$

$$= \frac{17,25}{100} \times 0,00105 \text{ gram} = 0,00018 \text{ mg}$$

$$\text{Kandungan Protein 9,65 \%} = 9.650 \text{ mg / 100 gram}$$

$$= \frac{9.650}{100} \times 0,00105 \text{ gram} = 0,10 \%$$

$$P_3 (7,5\%) = \text{Berat Ikan} = 0,478$$

$$\text{Jumlah Ikan} = 1 \text{ ekor}$$

$$\begin{aligned} \text{Presentase Pakan} &= 5\% \times 0,478 \text{ gram} \times 1 \\ &= 0,023 \end{aligned}$$

$$\text{T. Labu Kuning (7,5\%)} = \frac{7,5}{100} \times 0,023 \text{ g}$$

$$= 0,00172 \text{ gram (1 kali makan)}$$

$$\text{Kandungan beta-karoten} = 17,25 \text{ mg / 100 gram}$$

$$= \frac{17,25}{100} \times 0,00172 \text{ gram} = 0,00029 \text{ mg}$$

$$\begin{aligned} \text{Kandungan Protein } 9,65 \% &= 9.650 \text{ mg} / 100 \text{ gram} \\ &= \frac{9.650}{100} \times 0,00172 \text{ gram} = 0,16 \% \end{aligned}$$

$$P_4 (10\%) = \text{Berat Ikan} = 0,630$$

$$\text{Jumlah Ikan} = 1 \text{ ekor}$$

$$\begin{aligned} \text{Presentase Pakan} &= 5\% \times 0,630 \text{ gram} \times 1 \\ &= 0,031 \end{aligned}$$

$$\begin{aligned} \text{T. Labu Kuning (} 10 \% \text{)} &= \frac{10}{100} \times 0,031 \text{ g} \\ &= 0,0031 \text{ gram (} 1 \text{ kali makan)} \end{aligned}$$

$$\begin{aligned} \text{Kandungan beta-karoten} &= 17,25 \text{ mg} / 100 \text{ gram} \\ &= \frac{17,25}{100} \times 0,0031 \text{ gram} = 0,00053 \text{ mg} \end{aligned}$$

$$\begin{aligned} \text{Kandungan Protein } 9,65 \% &= 9.650 \text{ mg} / 100 \text{ gram} \\ &= \frac{9.650}{100} \times 0,0031 \text{ gram} = 0,29\% \end{aligned}$$



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FAKULTAS SAINS DAN TEKNOLOGI
UNIVERSITAS PGRI ADI BUANA SURABAYA
KAMPUS : Jl.Dukuh Menanggal XII, Telp.(031)8281183,**

FORM SKBIO.05

BUKTI BIMBINGAN SKRIPSI

Nama : Lusia Evatrita Ratu Peo
NIM : 192500015
Judul Skripsi : Rekayasa Nutrisi Pakan Melalui Penambahan Tepung Labu Kuning Untuk Meningkatkan Kualitas Warna dan Pertumbuhan Pada Ikan Cupang (*Betta splendens*)
Dosen Pembimbing I : Prof. Dr. Ir. Pungky S. W, Kusuma . M . Si

No	Tanggal	Materi Bimbingan	Pembimbing I
1.	21 Mei 2023	Revisi BAB 5	
2.	22 Mei 2023	Revisi BAB 5	
3.	26 Mei 2023	Revisi BAB 5	
4.	07 Juni 2023	Revisi BAB 5	
5.	18 Juni 2023	Revisi BAB 5	
6.	26 Juni 2023	Revisi BAB 5,6 dan 7	
7.	27 Juni 2023	Revisi BAB 1 sampai 7	
8.	29 Juni 2023	ACC	



Dosen Pembimbing I,

Prof. Dr. Ir. Pungky S. W, Kusuma . M . Si
NIP/NPP. 8503084/DY



**PROGRAM STUDI BIOLOGI
FAKULTAS SAINS DAN TEKNOLOGI
UNIVERSITAS PGRI ADI BUANA SURABAYA
KAMPUS : Jl.Dukuh Menanggal XII, Telp.(031)8281183,**

FORM SKBIO.09

PERSETUJUAN PERBAIKAN SKRIPSI

Dosen Pembimbing dan Penguji dibawah ini telah menyetujui atas perbaikan naskah skripsi yang dilakukan oleh:

Nama : Lusia Evatrita Ratu Peo
NIM : 192500015
Prodi : Biologi
Judul : Rekayasa Nutrisi Pakan Melalui Penambahan Tepung

Labu Kuning Untuk Meningkatkan Kualitas Warna dan
Pertumbuhan Pada Ikan Cupang (*Betta splendens*)

DOSEN PEMBIMBING

No	Nama	Tanda tangan	Tanggal Persetujuan
1.	Prof. Dr. Ir. Pungky S.lamet Wisnu Kusuma,M.Si		9/8 2023

DOSEN PENGUJI

No	Nama	Tanda tangan	Tanggal Persetujuan
1.	Prof.Dr.Ir.Tatang Sopandi,MP		9/8/2023

*Catatan:

Naskah skripsi dapat digandakan dan dijilid, apabila mahasiswa yang bersangkutan telah mendapat persetujuan dari dosen pembimbing dan dosen penguji.