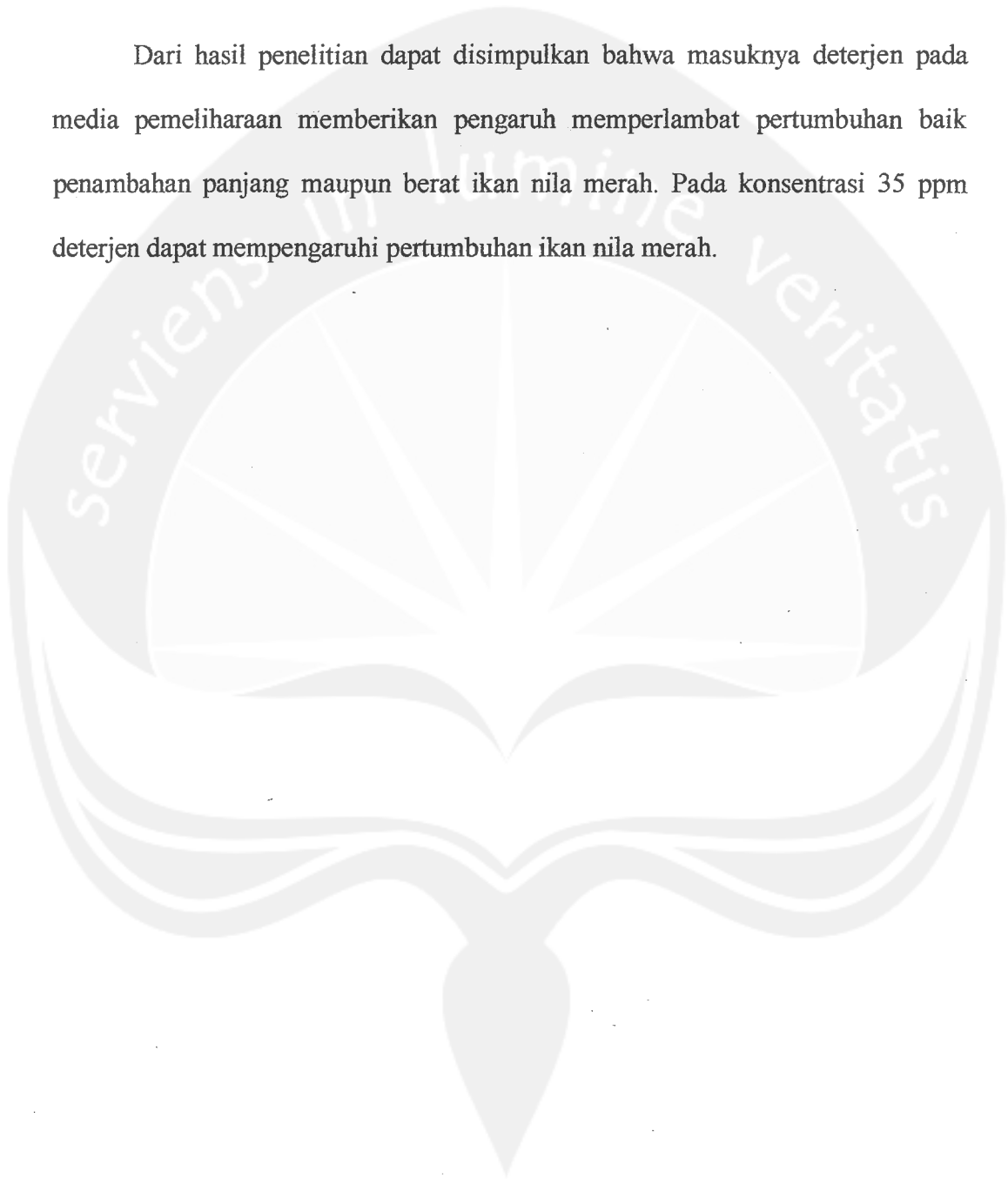


## **BAB V**

### **KESIMPULAN**

Dari hasil penelitian dapat disimpulkan bahwa masuknya deterjen pada media pemeliharaan memberikan pengaruh memperlambat pertumbuhan baik penambahan panjang maupun berat ikan nila merah. Pada konsentrasi 35 ppm deterjen dapat mempengaruhi pertumbuhan ikan nila merah.



## DAFTAR PUSTAKA

- Alabaster, V.S., and Lyod, R., 1982, *Water Quality Criteria For Fresh Water Fish*, 2 nd Edition, Butter Worth, Scientific, London, 21-23; 128
- Anonymous, 1982, *Nutrisi dan Teknologi Makanan Ikan Dalam Menunjang Pengembangan Perikanan Budidaya Air Tawar*, Direktorat Jendral Perikanan, Jakarta.
- Ariens, C.J., E. Mutschler and A.M. Simon, Padmawirata., 1986, *Toksikologi Umum*, Pengantar, GAMA University Press, Yogyakarta
- Asnawi, S., 1986, *Pemeliharaan Ikan Dalam Keramba*, PT. Gramedia, Jakarta, 35-41, 49-64.
- Banerjii, S.K., 1976, *Deterjens*, Journal of Water Pollution Control Federation 48, No. 6, P. 1111-1115.
- Brown, M.E., 1957, *The Fisiology of Fishes*, Vol II ( Behavior), Acad, Press. Inc., New York 413.
- Boyd, E. C., 1979, *Water Quality in Warm Water Fish, Pond*, Auburn University, Agricultural. Experment Station, Carf Master Printers Inc. Opelika Alagama P. 20-74.
- Cunliffe, W.J. and S.G. Tan, 1976, Hand Excema and All That, *The Practitioner* 216, P. 678-682.
- Dean, R. B., 1948, *Modern Colloid*, 2<sup>nd</sup> Printing, D Van Nustrand Co. inc. Toronto - London - New York.
- Dix, N.M., 1981, *Enviromental Pollution*, John Willey and Sons, Chishester - New York - Brisbane - Toronto.
- Djajasewaka, H., 1985, *Pakan Ikan (Makanan Ikan)*, CV. Yasaguna, Jakarta.
- Djajadireja, Rustami, S. Hatima dan Z. Arifin, 1990, *Buku Pedoman Pengenalan Sumber Perikanan Air Tawar (Jenis-jenis Ikan Ekonomi Penting)*, Direktorat Jendral Perikanan, Jakarta, 75.
- Dolan, J.M. and C.H. Albert, 1976, *The Lethality of An Intact and Degraded LAS Mixture to Blue Gill Sun Fish and A Snail*, Journal of Water Pollution Control Federation 48, No. 11. pp. 2570 - 2577

- Eden, G.E., 1975, *Water And Their Treatment*. (Dalam *Chemistry and Pollution*, Bend, R.R. and C.A. Mc. Auliffe, eds.) The Mac Millan Press Ltd., London. Pp. 119.
- Effendi, M.I., 1978, *Biologi Perikanan*, Bagian I. Fakultas Perikanan IPB, Bogor.
- Effendi, M.I., 1979, *Methodes Biologi Perikanan*, Yayasan Dewi Sri, Bogor.
- Gerking, S.D., 1969, *Biological System*, W.B., Scunders Company Phyladelphia, London, Toronto, Toppan Co, Limited, Tokyo, Japan, P-220.
- Guntur, S., 1992, *Penentuan Toksisitas 2 Macam Deterjen Terhadap Ikan Karper*, Skripsi Fakultas Biologi, UGM, Yogyakarta.
- Guyton, 1979, *Fisiologi Kedokteran*, Edisi ke-3, EGC Kelapa Muda, Jakarta
- Hepher, S., I.C., Lioo, S.H., Chang and C.S., Hies, 1976, *Food Utilition Thy Red Tilapia Effects of Direct Composition, Feeding Level and Temperatur Onolition Effeciencis for Maintenance and Growth*, *Aquaculture* 32 (1983) ; 225-275 Esevier Science Publisher B.V. Nederland.
- Hickling, C.F., 1962, *Fish Culture*, New Edition, Faber and Faber, London
- Hudson, B.J.F., 1971, *Getting of Froth Chemisty and Industry*, Feb. 20 th, pp. 216-218.
- Hughes, G.M; and K. Nylholm, 1978, Ventilation in Rainbow trout (*Salmo Gairdreri*, R.C. Chidson ) with Pamoged gills, *J. Fish, Biol.*, Vol. 14. P. 285-288.
- Jangkaru, Z., 1974, *Makanan Ikan*, Lembaga Penelitian Perikanan Darat, Direktorat Jendral Perikanan, Bogor.
- Korte, F., 1976, Occurrence and fate of Synthetics Chemical ini Environment, in Hunter, W.J and J.P.M. Smects, 1976. *The Evaluation of Toxycological Data For The Protection of Public Health*, Proccending of International Colloquium Luxemburg Pentagon Press. Pp. 235-246.
- Largher, K.F., J.E., Bardach and R.R. Miller, 1977., *Ichtiology*, John Willey and Sons, New York.
- Loomis, T.A dan I.A. Donatus, 1978, *Toksikologi Dasar*, 3<sup>th</sup> ed, IKIP Semarang Press.
- Maas, M., 1969, *Cytolysis of Yeast by Surfactans*, Prukkerij, Bronder, Offset, N.V., Rotterdam.

- Maynard, L.A. and J.K. Lossly, 1956, *Animal Nutrition*, Mc. Graw Hill Book Company Inc. New York.
- Mc. Bain, J.W., 1949, *Colloid Science*, 2<sup>nd</sup> Printing, D. Van Nostrand Co. Inc., Toronto - London - New York.
- Mitrovic, V.V. 1973, Sublethal Effects of Pollution of Fish *dalam* M. RUIRO (ed.) *Marine Pollution and sea Life*, Fishing News Books Ltd, England.
- Mudjiman, A., 1987, *Makanan Ikan*, Edisi ke II, PT. Penebar Swadaya, Jakarta, 100-112.
- Nelson, J.S., 1988, *Fishes of the World*, 2<sup>nd</sup> Edition, John Wiley and Sons, New York, 11-37.
- Pullin, R.S.U., 1984, *Tilapia Genetic Resources For Aquaculture*, Leds. J., Proceedings of Workshop on Tilapia Genetic Resources Management, Manila Philippines, 256.
- Raphael. C., 1962, *Detergent and Surface Active Agent*, Manufacturing Chemical 33 pp. 114-115, 323-325.
- Ryadi, S., 1984, *Pencemaran Air Dasar-Dasar dan Pokok-Pokok Penanggulangannya*, Karya Anda, Surabaya.
- Rifai, N., 1986, *Budidaya Ikan Nila Secara Intensif*, Fakultas Perikanan IPB, Bogor.
- Saanin, H., 1968, *Taksonomi dan Kunci Identifikasi Ikan*, Jilid I, Binatjipta, Bandung, 256.
- Said, G.E dan Haris, A., 1992, *Deterjen dan Pencemaran Lingkungan*, Kompas 7 Desember 1992, hal. 3.
- Santoso, B., 1996, *Budidaya Ikan Nila*, Kanisius, Yogyakarta.
- Sastrawijaya, A.T., 1991, *Pencemaran Lingkungan*, Penerbit Rineka Cipta, Jakarta.
- Shinichi, T., 1976, *Effects of Surfactant on Fish*, Chemical Abstract, 82, 107120.
- Soeseno, S., 1984, *Dasar-dasar Perikanan Umum*, Untuk Sekolah Pertanian Pembangunan, CV. Yasaguna, Jakarta.
- Sugiarto, 1987, *Dasar-dasar Pengelolaan Air Limbah*, UI Press Jakarta, P. 1-53.
- Sugiarto, 1988, *Teknik Pembenihan Ikan Mujair dan Nila*, Edisi I, C.V. Simplex Jakarta, 1-7; 15-19.

- Sumantadinata, K., 1983, *Pengembangan Ikan-ikan Peliharaan Di Indonesia*, Sastra Hudaya.
- Suyanto, S.R., 1995, *Nila*, Penebar Swadaya, Jakarta .
- Swisher, R.D., and H.E. Alen, 1985, Surfactant, dalam Grenberg, A.E., R.R. Trussel, and L.S. Clesers, 1985, *Standar Methods For the Examination of Water and Waste Water*, 16 th Edition, American Public Health Association, American Water Work Assic, *Water Dollution Fed*, Washington.
- Tandjung, H.S.D., 1983, *Penentuan Toksisitas Suatu Bahan Pencemar di Lingkungan Perairan*, Kursus Andal I. Dep. P dan K UGM, Pusat Penelitian Studi Lingkungan, p. 1-12.
- Thomssen, H., and J.W. Mc. Cutheon, 1949, *Soap and Detergent*, Mac Nair - Porland Co. New York.
- Toms, R.G., 1975, *Management of River Water Quality ini River Ecology*, B.A. Wgitton, ed, Bluckwel Scientific Publication, Oxford - London, Edinburg, Melbourne, pp. 561
- Van Emdem, S.A., C.C.M. Kroon, E.N. Schoeman, H.A. Van Seventer, 1975, Toxicity of Some Detergents Tested on Biophalaria Glabrata, Labiestes reticularis and Aedes aegypty, *Chemical Abstrack*, 82.
- Yohanes, H., 1974, *Kimia Koloid dan Kimia Permukaan*, Universitas Gadjah Mada, Yogyakarta.
- Zonnevelt, N., E.A. Huiman dan J.H. Boon, 1991, *Prinsip-prinsip Budaya Ikan*, PT. Gramedia Pustaka Utama, Jakarta, 336.



**LAMPIRAN**

BERAT BADAN IKAN NILA MERAH  
PERLAKUAN

OBS	MINGGU	UL	0	15	25	35	45	55
1	1	1	2.601	2.030	1.706	1.509	1.469	1.238
2	1	2	2.574	2.195	1.937	1.742	1.479	1.336
3	2	1	2.980	2.220	2.143	1.760	1.750	1.796
4	2	2	2.926	2.450	2.040	1.794	1.555	1.396
5	3	1	3.005	2.466	2.292	2.246	2.090	1.891
6	3	2	3.089	2.544	2.270	2.140	2.024	1.915

PANJANG IKAN NILA MERAH  
PERLAKUAN

OBS	MINGGU	UL	0	15	25	35	45	55
1	1	1	5.36	4.50	4.21	4.15	3.79	3.57
2	1	2	6.02	4.74	4.61	4.60	4.50	3.60
3	2	1	5.53	4.74	4.34	4.25	4.19	4.15
4	2	2	6.17	5.12	4.64	4.61	4.60	3.88
5	3	1	6.30	5.10	4.79	4.61	4.54	4.27
6	3	2	6.20	5.30	4.68	4.68	4.65	4.15

----- MINGGU=1 -----

Analysis of Variance Procedure  
Class Level Information

Class	Levels	Values
PERL	6	0 15 25 35 45 55
UL	2	1 2

Number of observations in by group = 12  
Analysis of Variance Procedure

Dependent Variable: BERAT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
PERL	5	2.23245200	0.44649040	36.87	0.0002
Error	6	0.07265400	0.01210900		
Corrected Total	11	2.30510600			

R-Square	C.V.	Root MSE	BERAT Mean
0.968481	6.052855	0.110041	1.81800000

Duncan's Multiple Range Test for variable: BERAT

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 6 MSE= 0.012109

Number of Means	2	3	4	5	6
Critical Range	0.269	0.279	0.284	0.286	0.287

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	PERL
A	2.588	2	0
B	2.112	2	15
C	1.821	2	25
C			
D	1.625	2	35
D			
D	1.474	2	45
E			
E	1.287	2	55



----- MINGGU=2 -----

Analysis of Variance Procedure  
Class Level Information

Class	Levels	Values
PERL	6	0 15 25 35 45 55
UL	2	1 2

Number of observations in by group = 12  
Analysis of Variance Procedure

Dependent Variable: BERAT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
PERL	5	2.67034000	0.53406800	24.13	0.0007
Error	6	0.13280300	0.02213383		
Corrected Total	11	2.80314300			
R-Square		C.V.	Root MSE	BERAT Mean	
0.952624		7.195862	0.148774	2.06750000	

Duncan's Multiple Range Test for variable: BERAT

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 6 MSE= 0.022134

Number of Means	2	3	4	5	6
Critical Range	0.364	0.377	0.383	0.387	0.388

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	PERL
A	2.953	2	0
B	2.335	2	15
B			
C	2.092	2	25
C			
C	1.777	2	35
D			
D	1.652	2	45
D			
D	1.596	2	55

----- MINGGU=3 -----

Analysis of Variance Procedure  
Class Level Information

Class	Levels	Values
PERL	6	0 15 25 35 45 55
UL	2	1 2

Number of observations in by group = 12  
Analysis of Variance Procedure

Dependent Variable: BERAT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
PERL	5	1.64547200	0.32909440	132.56	0.0001
Error	6	0.01489600	0.00248267		
Corrected Total	11	1.66036800			
R-Square		C.V.	Root MSE		BERAT Mean
	0.991028	2.137553	0.049826		2.33100000

Duncan's Multiple Range Test for variable: BERAT

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 6 MSE= 0.002483

Number of Means	2	3	4	5	6
Critical Range	0.122	0.126	0.128	0.129	0.130

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	PERL
A	3.0470	2	0
B	2.5050	2	15
C	2.2810	2	25
C	2.1930	2	35
D	2.0570	2	45
E	1.9030	2	55

----- MINGGU=1 -----

Analysis of Variance Procedure  
Class Level Information

Class	Levels	Values
PERL	6	0 15 25 35 45 55
UL	2	1 2

Number of observations in by group = 12  
Analysis of Variance Procedure

Dependent Variable: PANJANG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
PERL	5	4.82474167	0.96494833	8.51	0.0107
Error	6	0.68035000	0.11339167		
Corrected Total	11	5.50509167			
R-Square		C.V.	Root MSE	PANJANG Mean	
	0.876414	7.531857	0.336737	4.47083333	

Duncan's Multiple Range Test for variable: PANJANG

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 6 MSE= 0.113392

Number of Means	2	3	4	5	6
Critical Range	0.824	0.854	0.868	0.875	0.878

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	PERL
A	5.690	2	0
B	4.620	2	15
B			
C	4.410	2	25
C			
C	4.375	2	35
C			
C	4.145	2	45
C			
C	3.585	2	55

----- MINGGU=2 -----

Analysis of Variance Procedure  
Class Level Information

Class	Levels	Values
PERL	6	0 15 25 35 45 55
UL	2	1 2

Number of observations in by group = 12  
Analysis of Variance Procedure

Dependent Variable: PANJANG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
PERL	5	4.10660000	0.82132000	9.71	0.0077
Error	6	0.50730000	0.08455000		
Corrected Total	11	4.61390000			
R-Square		C.V.	Root MSE	PANJANG Mean	
	0.890050	6.206506	0.290775	4.68500000	

Duncan's Multiple Range Test for variable: PANJANG

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 6 MSE= 0.08455

Number of Means	2	3	4	5	6
Critical Range	0.712	0.737	0.749	0.756	0.758

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	PERL
A	5.850	2	0
B	4.930	2	15
B			
C	4.490	2	25
C			
C	4.430	2	35
C			
C	4.395	2	45
C			
C	4.015	2	55

----- MINGGU=3 -----

Analysis of Variance Procedure  
Class Level Information

Class	Levels	Values
PERL	6	0 15 25 35 45 55
UL	2	1 2

Number of observations in by group = 12  
Analysis of Variance Procedure

Dependent Variable: PANJANG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
PERL	5	5.12934167	1.02586833	131.66	0.0001
Error	6	0.04675000	0.00779167		
Corrected Total	11	5.17609167			

R-Square	C.V.	Root MSE	PANJANG Mean
0.990968	1.787152	0.088270	4.93916667

Duncan's Multiple Range Test for variable: PANJANG

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 6 MSE= 0.007792

Number of Means	2	3	4	5	6
Critical Range	0.216	0.224	0.228	0.229	0.230

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	PERL
A	6.2500	2	0
B	5.2000	2	15
C	4.7350	2	25
C	4.6450	2	35
C	4.5950	2	45
D	4.2100	2	55