

## DAFTAR PUSTAKA

- Afiati, F. 2004. Proporsi dan karakteristik spermatozoa x dan y hasil separasi kolom albumin. JMP. 27(1) : 16- 20.
- Alters, S. 2000. Biology understanding life.Jones and Bartlett Publishers, Canada: 834 hlm.
- Agarwal, A. & T.M. Said. 2011. Interpretation of basic semen analysis and advanced semen testing. 9 hlm
- Algarubi, S.M. 2014. Effect of sperm quality of beef cattle on percentage. IJSR 3(11): 790—793.
- Anwar., N. Solihati, dan S.D. Rasad. 2019. Pengaruh medium dan lama inkubasi dalam proses sexing sperma terhadap kualitas semen sapi Boer. Jurnal ilmu ternak. 19 (1): 53 – 61
- Akhdiat, T. 2012. Proporsi spermatozoa Y hasil pemisahan dengan fraksi albumen telur dan lama penyimpanan semen domba lokal. Jurnal Ilmiah Ilmu-Ilmu Peternakan. 15(2): 59-69.
- Applegate, E. 2011. The anatomy and physiology learning system. 4th ed. Saunders Elsevier, USA: 467 hlm.
- Astuti, S. M. 2009. Teknik pengaturan suhu dan waktu pengeringan beku bawang daun (*Allium fistulosum L.*).Buletin Teknik Pertanian, 14(1), 17-22.
- Barth, A.D dan R.J. Oko. 1989. Abnormal Morphology of Bovine Spermatozoa. owa State University Press. owa.
- Berg, G., C. Zachow, J. Lottmann, M. Götz, R. Costa, and K. Smalla. 2005. Impact of plant species and site on rhizosphere-associated fungi antagonistic to *Verticillium dahliae* Kleb. Appl. Environ. Microbiol. 71(8): 4203-4213.
- Budai, C., I. Egerszegi., J. Oalah., A. Javor, & A. Kavacs. 2014. Application of semen evaluation techniques. Agrartudomanyi Kozlemenyek 59(1): 1— 10
- Butar, E. K. (2009). Efektivitas Frekuensi Exercise Terhadap Peningkatan Kualitas Semen Sapi Simmental. Skripsi. Fakultas Pertanian, Universitas Sumatra Utara.
- Cahya, R. I., Y. S. Ondho, dan E. T. Setiatin. 2017. Persentase Membran Plasma Utuh dan Tudung Akrosom Utuh spermatozoa sapi Peranakan Etawah dalam pengencer yang berbeda. Prosiding Ilmu-Ilmu Peternakan. Magelang.

- Cervantes-Espinosa, R., dan A. Cordova-Izquierdo. 2012. Review Article.: Sexing sperm of domestic animals. *Trop Anim Health Prod.*
- Cochran, P.E. 2011. Veterinary anatomy & physiology. 2nd ed. Cengage Learning, USA: xii + 357 hlm
- Chenoweth PJ, 2005. Genetic sperm defects. *Journal Theriogenology* 64(3):457-468
- Chenoweth, P. J., and Lorton, S. P. 2014. Animal Andrology Theories And Applications. CABI. UK.
- Chian, R. & P. Quinn. 2010. Fertility cryopreservation. Cambridge University Press, United Kingdom: xiii + 260 hlm.
- Devandra C dan Burns M, 1994. Produksi Sapi daerah Tropis. Institut Petanian Bogor. Bogor
- Dewi, A. S., Y.S. Ondho, dan E. Kurnianto. 2012. Kualitas semen berdasarkan umur pada sapi jantan jawa. *Animal Agriculture Journal*. 1(2):126-133.
- Else, P. L. and E. Kraffe. 2015. Docosahexaenoic and arachidonic acid peroxidation: it's a within molecule cascade. *Biochimica et Biophysica Acta* 1848: 417–421.
- Ervandi, M., T. Susilawati, dan S. Wahyuningsih. 2013. Pengaruh pengencer yang berbeda terhadap kualitas spermatozoa sapi hasil sexing dengan gradient albumin (putih telur). *JITV*. 18 (3): 177 – 184.
- Fatahillah. T. Susilawati dan N. Isnaini. 2016. Pengaruh lama sentrifugasi terhadap kualitas dan proporsi spermatozoa x- y sapi limousine hasil sexing dengan gradien densiteas percoll menggunakan pengencer cep- 2+10% kt. *JITT*. 17(1) : 86- 97.
- Feradis. 2010. Reproduksi Ternak. Alfabeta. Bandung
- Ferlianthy, R. 2016. Pengaruh Lama Inkubasi terhadap Proporsi Sperma Pembawa Kromosom X-Y dan Kualitas Semen Sapi Saanenranakan Etawah. <http://jurnal.unpad.ac.id>.
- Ferlianthy, R. 2017. Pengaruh lama inkubasi terhadap proporsi sperma pembawa kromosom X-Y dan kualitas semen Sapi Saanenranakan etawah. Student eJournal. Universitas Padjajara
- Garner DL, Hafez ESE, 2008. Spermatozoa and seminal plasma in reproduction in farm animals 7th edition. Ed by ESE Hafez, and B Hafez. Edition Blackwell: 96-109

- Garner, D.L. and E.S.E. Hafez. 2000. Spermatozoa and Seminal Plasma. In Reproduction in Farm Animal. 7th ed., E.S.E. Hafez (ed). Lea and Febiger Publishing, Philadelphia.
- Hafez, E. S. E. 1993. Reproduction In Farm Animal.6 th Edition. Lea and Fibiger.
- Hafez, E. S. E. and B. Hafez. 2000. X and Y Chromosome Bearing Spermatozoa. Reproduction in Farm Animals. E.S.E. Hafez (ed). 7th edn. Blackwell Publishing Professional USA: 390-394.
- Hafez, E.S.E. 2004. X and Y-Chromosome-Bearing Spermatzoa dalam Reproduction in Farm Animal. 8 th ed. Lea & Febiger Philadelphia, USA pp 440 – 44.
- Hartati. Mariyono dan D.B. Wibowo. 2009. Respons pertumbuhan sapi peranakan ongole dan silangan pada kondisi pakan berbasis low external input. Seminar Nasional Teknologi Peternakan dan Veteriner.
- Hasbi., H. Sonjaya, dan S. Gustina. 2011. Pengaruh medium pemisah, penambahan ekstrak kopi sebelum proses pemisahan spermatozoa pembawa kromosom X dan Y dan lama penyimpanan terhadap kualitas semen cair sapi peranakan etawa. JITP. 1 (2): 107 – 118.
- Kaneko S, Yamaguchi J, Kobayashi T, Lizuka R. 1983. Separation of human X and Y bearing sperm using percoll density gradient centrifugation. Fertil Sterile. 40:235- 240.
- Karinah, N., E. Yanti, & N. Arma. 2015. Bahan ajar embriologi manusia. Deepublish, Yogyakarta: xii + 447 hlm
- Kartika, N.M.A. 2015. Proporsi dan kualitas spermatozoa Sapi Bali hasil separasi dalam kolom labumin bsa (bovine serume albumin). GaneC Swara. 11(2) : 45- 50
- Luzardin., T. Saili, dan A.S. Aku. 2020. Hubungan lama waktu sexing dengan kualitas spermatozoa Sapi Bali (*Bos sondaicus*) pada medium sexing Triskuning telur. Jurnal Ilmiah Peternakan Halu Oleo.
- Legato, M.J. 2004. Principles of gender-specific medicine. Elsevier Academic Press, USA: xvii + 1241.
- Mardiana. 2017. Perbandingan pengencer andromed, susu skim dan pengencer alami terhadap kualitas spermatozoa Sapi Bali (*bos sondaicus*). Jurnal Bionature. 18(1) : 21- 32.
- Mardiyah, E. N. O. K. 2006. Pemisahan Sperma Pembawa Kromosom X dan Y Sapi dengan Kolom Media Pemisah Albumin. Temu Teknis Nasional Tenaga Fungsional Pertanian, 54.

- Mahfud, A., Isnaini, N., Yekti, A. P. A., Kuswati, K., & Susilawati, T. 2019. Kualitas Spermatozoa Post Thawing Semen Beku Sperma Y Hasil Sexing Pada Sapi Limousin. JITP, 20(1), 1- 7.
- Metz, C.B. & A. Monroy. 1967. Fertilization: comparative morphology, biochemistry, and immunology. Academic Press, USA: xiii + 457 hlm.
- Natalia, F., T. Sardjito., R.T.S. Adikara., S. Utama., S.H. Warsito dan P. Srianto. 2016. Kajian morfometri spermatozoa terejakulasi sugar glider. Ovozoa. 5 (1) : 9 – 12.
- Nabilla. A., R. I. Arifiantini., B. Purwantara. 2018. Kualitas semen segar Sapi Bali umur produktif dan nonproduktif serta penentuan konsentrasi krioprotektan dalam pengencer tris kuning telur. Jurnal Veteriner. 19(2)::242-25.
- Oliveira, P.F. & M.G. Alves. 2015. Sertoli cell metabolism and spermatogenesis. Springer, London: 75 hlm.
- Oka, IGL. 2010. Conservation and genetic improvement of Bali Cattle. Proc. Conservation and Improvement of World Indigenous Cattle. 110-117.
- Ondho, Y. S. 2020. Manfaat Indogofera sp. Dibidang Reproduksi Ternak. Semarang: Universitas Diponegoro Press. 38-42.
- Pancahastana H, 1999. Upaya mengubah sex rasio spermatozoa dengan melakukan pemisahan spermatozoa X dan Y menggunakan putih telur pada Sapi Bali. Fakultas Peternakan. Universitas Brawijaya Malang.
- Partodihardjo S. 1992. *Ilmu Reproduksi Ternak*. Mutiara Sumber Widya. Jakarta. Pineda MH, 1989. The Biologi of Sex. In Veterinary Endocrinology and Reproduction. Fourth Edition. Mc Donald, LE and Pineda, MH (Editors) *Lea and Febiger. Philadelphia*.
- Partodiharjo, S. 1987. Ilmu Reproduksi Hewan. Jakarta : Mutiara Sumber Widya.
- Partodiharjo, S. 1992. Ilmu Reproduksi Hewan. Cetakan ke-3 Penerbit Mutiara Sumber Widia, Jakarta.
- Partodihardjo S, 1982. Ilmu Reproduksi Hewan. Penerbit Mutiara. Jakarta.
- Pasaribu, S.M. 2014. Penerapan Asuransi Pertanian di Indonesia. Di dalam: Haryono, E. Pasandaran, M. Rachmat, S.Mardianto, Sumedi, H.P. Salim dan A. Hendriadi., editor. Reformasi Kebijakan Menuju Transformasi Pembangunan Pertanian. Jakarta: IAAD Press. Pp.491-514
- Pasupuleti, V. 2007. Role of glycolysis and respiration in sperm metabolism and motility. 55 hlm.

- Purwantara, B., R.R. Noor., G. Andersso., H. Rodriguez- Martinez. 2012. Banteng and Bali Cattle in Indonesia: Status and Forecasts.
- Purwadi, Dkk. 2017. Penanganan Hasil Ternak. UB Press. Malang
- Rizal, M., Herdis. 2010. Inseminasi Buatan pada domba. Penerbit Rineika Cipta. Jakarta.
- Rizal, M., M. R. Toelihere, T. L. Yusuf, B. Purwantara, dan P . Situmorang. 2003. Karakteristik penampilan reproduksi pejantan domba Garut. Jurnal Ilmu Ternak dan Veteriner 8: 134-140.
- Rurangwa, M. 2004. Sperm morphology. Springer, London.
- Saili, T. 1999. Efektifitas penggunaan albumin sebagai medium separasi dalam upaya mengubah rasio alamiah spermatozoa pembawa kromosom X dan Y pada sapi.Tesis.Program Pascasarjana. Institut Pertanian Bogor
- Samariyanto. 2004. Alternatif kebijakan perbibitan sapi potong dalam era otonomi daerah. Lokakarya Nasional Sapi Potong
- Sarastina., T. Susilawati dan G. Ciptadi. 2007. Analisa beberapa parameter motilitas spermatozoa pada berbagai bangsa sapi menggunakan computer assisted semen analysis(casa). Jurnal Ternak Tropika. 6(2):1-12
- Simon, Shinta. (2014). Karakteristik Fungsional Tepung Putih Telur Yang Dikeringkan dengan Freeze dryer Pada Suhu dan Ketebalan Berbeda. [Skripsi]. Fakultas peternakan. Universitas Hasanuddin Makassar.
- Sujoko, H. M.A. Setiadi, &A. Boediono. 2009. Seleksi spermatozoa domba garut dengan metode sentrifugasi gradien densitas percoll. Jurnal Veteriner 10(3): 125--132.
- Sureka, P., K. Nilanz ., T. Eswara mohan and K. Balasu bramaniam. 2013. Sex pre-selection by quantification of Y chromosome bearing spermatozoa in goat species. International Journal of Scientifica nd Research Publications. 3(1):1- 10.
- Susilawati, T. 2011. Spermatozoatology. Universitas Brawijaya Press. Malang.
- Susilawati T dan Rahayu S 2013 Membran Spermatozoa Hasil Seksing Gradien Albumin Berpengencer Andromed dan Cauda Epididymal Plasma-2 Ditambahkan Kuning Telur. Jurnal Veteriner 14 3: 371-378
- Susilawati, T. 2002. Sexing Spermatozoa Sapi Saanenranakan Etawah Menggunakan Gradien Putih Telur. Jurnal Widya Agrika. 10 (2): 97-105.

- Susilawati, T. 2014. Sexing Spermatozoa. UB Press, Universitas Brawijaya, Bandung.
- Susilawati, T. 2013. Pedoman Inseminasi Buatan. Universitas Brawijaya Press (UB Press). Malang.
- Sutama, I-K., Setiadi., Adiat, B P. U., Budiarsana, I.G.M., Kostman, T., Maulana., Mulyawan dan Sukmana, R. 2000. Uji Kualitas Semen Beku Peranakan Etawah dan Sapi Boer. Rekayasa Teknologi Peternakan. 88-111.
- Surachman, M., Herdis, Yulnawati, M. Rizal, dan H. Maheshwari. 2009. Kualitas semen cair asal epididimis kerbau belang dalam bahan pengencer Andromed yang mendapat penambahan sukrosa. Media Peternakan. 32 (2).
- Seidel, V. 2012. Initial and bulk extraction of natural product isolation. In S.D. Sarker & L. Nahar (eds). Natural Product Isolation, Methods in Molecular Biology. 864: 27–41.
- Septiyani, R. 2012. Hubungan Antara Viabilitas, Motilitas dan Keutuhan Membran Plasma Spermatozoa Semen Beku Sapi Limousin. Skripsi. Institut Pertanian Bogor. Bogor.
- Solihati, N., Soeparna., S. D. Rasad., dan R. Ferlianthy. 2017. Proportion and Quality of X-Y Chromosome Bearing Sperm on Diluted Semen after Incubation in Different Time of Etawah Crossbreed Goat. The 7th International Seminar on Tropical Animal Production: 696-701.
- Solihati N., R. Idi ., S.D. Rasad., M. Rizal dan M. Fitrianti. 2008. Kualitas spermatozoa cauda epididimis sapi peranakan ongole (po) dalam pengencer susu, tris dan sitrat kuning telur pada penyimpanan 4- 5°C. AnimalProduction10(1) : 22- 29.
- Soekarta, T. 2013. Teknologi penanganan dan pengolahan telur. Alfabeta. Bandung.
- Schenk, J.L., Suh, T.K., Seidel, G.E. Jr., 1999. Cryopreservation of bovine spermatozoa sexed by flow cytometrycell sorting. Theriogenology 52, 1375–1391.
- Syuhriatin, S. 2021. Efektivitas antioksidan likopen pada buah tomat (*lycopercisum esculentum*) terhadap normalitas dan abnormalitas spermatozoa sapi Bali dengan metode swim up. Jurnal Bionature, 22(1) : 9- 14.
- Storey, B. T. 2008. *Mammalian sperm metabolism: oxygen and sugar, friend and foe*. Int. J. Dev. Biol. 52: 427-437

- Takdir, M., Ismaya, S. Bitara, dan M. Syarif. 2016. Proporsi X dan Y, viabilitas dan motilitas spermatozoa domba sesudah pemisahan dengan albumin putih telur. Prosiding Seminar Nasional Inovasi Teknologi Pertanian, Banjarbaru 20 Juli 2016. Hlm 1333 – 1340.
- Tambing, S.N., Toelihere, M.R., Yusuf, T.L., Bambang, P., Sutama, I.K., Polmer, Z.S. 2003. Pengaruh Frekuensi Ejakulasi Terhadap Karakteristik Semen Segar dan Kemampuan Libido Sapi Saanen. J. Sain Vet., 21(2), 57-65.
- Toelihere. M.R. 1981. Fisiologi Reproduksi pada Ternak. Penerbit Angkasa : Bandung
- Toelihere, M.R. (1985), Inseminasi Buatan pada Ternak, Penerbit Angkasa, Bandung.
- Toelihere, M. R. 1993. Inseminasi Buatan Pada Ternak. Bandung: Angkasa.
- Triwulanningsih E., P. Situmorang, T. Sugiarti, R. G. Sianturi, dan D. A. Kusumaningrum. 2003. Pengaruh penambahan glutathione pada medium pengencer sperma terhadap kualitas semen cair (chilled semen). Jurnal Ilmu Ternak dan Veteriner. 8(2): 91-97.
- Wahjuningsih, S., T. Susilawati, Suyadi, M. N. I. Woro, Busono, N. Isnaini, dan A. P. A. Yekti. 2019. Teknologi reproduksi ternak. UB Press. Malang
- Wahyuningrum, M. R., dan Probosari, E. 2012. Pengaruh pemberian buah papaya (carica papaya L.) terhadap kadar trigliserida pada tikus Sprague dawley dengan hiperkloseterolemia . Journal of Nutrition Collage. 1(1): 192-198
- Wildeus S, 1995. Reproductive Management of The Meat Goat. [Http: //Goat.Clemson.Edu / NC % 20 Handbook / reproduction](http://Goat.Clemson.Edu / NC % 20 Handbook / reproduction).
- Wright, D. 2000. Human physiology and health. Heinemann, Oxford: 280 hlm
- Yendraliza, 2008. Inseminasi Buatan Pada Ternak. Suska Press. Pekanbaru.
- Yusrina, A., Solihatni, N., & Hilmia, N. (2018). Pengaruh Waktu Inkubasi Pada Proses Sexing Sperma Berbasis Glutathione Terhadap Motilitas dan Membran Plasma Utuh Chilled Semen Domba Lokal. Jurnal Ilmu Ternak Universitas Padjadjaran, 18(1), 41-46.
- Yusrina, A., Solihatni, N., & Hilmia, N. (2018). Pengaruh Waktu Inkubasi Pada Proses Sexing Sperma Berbasis Glutathione Terhadap Motilitas dan Membran Plasma Utuh Chilled Semen Domba Lokal. Jurnal Ilmu Ternak Universitas Padjadjaran, 18(1), 41-46.
- Zurriyati. Y., R.R. Noor., Dan R.R.A. Maheswari. 2011. Analisis Molekuler Genotipe Kappa Kasein (K- Kasein) Dan Komposisi Susu Sapi Peranakan Etawah, Saanen Dan Persilangannya. Jitv 16( 1): 61-70

## LAMPIRAN

Lampiran 1. Hasil Analisis Perhitungan Sidik Ragam Motilitas X

### Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
motilitas	P0	6	91.4883	3.87833	1.58332	87.4183	95.5584	85.87	97.74
	P1	6	83.3667	4.00894	1.63664	79.1595	87.5738	79.43	89.00
	P2	6	79.9400	6.15647	2.51337	73.4792	86.4008	70.87	87.88
	P3	6	78.7867	8.26286	3.37330	70.1153	87.4580	67.62	88.76
	Total	24	83.3954	7.45569	1.52189	80.2472	86.5437	67.62	97.74

### ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
motilitas	Between Groups	592.060	3	197.353	5.750	.005
	Within Groups	686.450	20	34.322		
	Total	1278.510	23			

### Multiple Comparisons

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
motilitas	LSD P0	P1	8.12167*	3.38243	.026	1.0660	15.1773
		P2	11.54833*	3.38243	.003	4.4927	18.6040
		P3	12.70167*	3.38243	.001	5.6460	19.7573
	P1	P0	-8.12167*	3.38243	.026	-15.1773	-1.0660
		P2	3.42667	3.38243	.323	-3.6290	10.4823
		P3	4.58000	3.38243	.191	-2.4756	11.6356
	P2	P0	-11.54833*	3.38243	.003	-18.6040	-4.4927
		P1	-3.42667	3.38243	.323	-10.4823	3.6290
		P3	1.15333	3.38243	.737	-5.9023	8.2090
	P3	P0	-12.70167*	3.38243	.001	-19.7573	-5.6460
		P1	-4.58000	3.38243	.191	-11.6356	2.4756
		P2	-1.15333	3.38243	.737	-8.2090	5.9023

\*. The mean difference is significant at the 0.05 level.

### Motilitas

perlakuan	N	Subset for alpha = 0.05	
		1	2
Duncan <sup>a</sup>	P3	6	78.7867
	P2	6	79.9400
	P1	6	83.3667
	P0	6	91.4883
	Sig.		.215 1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 2. Hasil Analisis Perhitungan Sidik Ragam Motilitas Y

**Descriptives**

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
motilitas	P0	6	91.4883	3.87833	1.58332	87.4183	95.5584	85.87	97.74
	P1	6	71.2833	4.90629	2.00298	66.1345	76.4322	62.31	76.81
	P2	6	64.0550	5.18578	2.11709	58.6129	69.4971	61.54	74.57
	P3	6	60.5550	6.71604	2.74181	53.5070	67.6030	52.32	70.07
	Total	24	71.8454	13.19008	2.69241	66.2757	77.4151	52.32	97.74

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
motilitas	Between Groups	3445.945	3	1148.648	41.352	.000
	Within Groups	555.553	20	27.778		
	Total	4001.498	23			

### Multiple Comparisons

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
motilitas	LSD P0	P1	20.20500*	3.04290	.000	13.8576	26.5524
		P2	27.43333*	3.04290	.000	21.0860	33.7807
		P3	30.93333*	3.04290	.000	24.5860	37.2807
	P1	P0	-20.20500*	3.04290	.000	-26.5524	-13.8576
		P2	7.22833*	3.04290	.028	.8810	13.5757
		P3	10.72833*	3.04290	.002	4.3810	17.0757
	P2	P0	-27.43333*	3.04290	.000	-33.7807	-21.0860
		P1	-7.22833*	3.04290	.028	-13.5757	-.8810
		P3	3.50000	3.04290	.264	-2.8474	9.8474
	P3	P0	-30.93333*	3.04290	.000	-37.2807	-24.5860
		P1	-10.72833*	3.04290	.002	-17.0757	-4.3810
		P2	-3.50000	3.04290	.264	-9.8474	2.8474

\*. The mean difference is significant at the 0.05 level.

### Motilitas

	perlakuan	N	Subset for alpha = 0.05	
			1	2
Duncan <sup>a</sup>	P3	6	78.7867	
	P2	6	79.9400	
	P1	6	83.3667	
	P0	6		91.4883
	Sig.		.215	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 3. Hasil Analisis Perhitungan Sidik Ragam Konsentrasi X

**Descriptives**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
konsentrasi	P0	6	.7285	.41339	.16877	.2947	1.1623	.44
	P1	6	.4533	.04282	.01748	.2942	.3841	.27
	P2	6	.3647	.08624	.03521	.2742	.4552	.22
	P3	6	.3392	.26311	.10741	.1772	.7295	.10
	Total	24	.8857	.28121	.05740	.3527	.5902	.10
								1.54

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
konsentrasi	Between Groups	.572	3	.191	3.057	.052
	Within Groups	1.247	20	.062		
	Total	1.819	23			

### Multiple Comparisons

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
konsentrasi	LSD	P0	P1	.38933*	.14416	.014	.0886 .6900
			P2	.36383*	.14416	.020	.0631 .6645
			P3	.27517	.14416	.071	-.0255 .5759
	P1	P0		-.38933*	.14416	.014	-.6900 -.0886
			P2	-.02550	.14416	.861	-.3262 .2752
			P3	-.11417	.14416	.438	-.4149 .1865
	P2	P0		-.36383*	.14416	.020	-.6645 -.0631
			P1	.02550	.14416	.861	-.2752 .3262
			P3	-.08867	.14416	.545	-.3894 .2120
	P3	P0		-.27517	.14416	.071	-.5759 .0255
			P1	.11417	.14416	.438	-.1865 .4149
			P2	.08867	.14416	.545	-.2120 .3894

\*. The mean difference is significant at the 0.05 level.

### Konsentrasi

	perlakuan	N	Subset for alpha = 0.05	
			1	2
Duncan <sup>a</sup>	P1	6	.3392	
	P2	6	.3647	
	P3	6	.4533	.4533
	P0	6		.7285
	Sig.		.463	.071

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 4. Hasil Analisis Perhitungan Sidik Ragam Konsentrasi Y

**Descriptives**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
konsentrasi	P0	6	.7285	.41339	.16877	.2947	1.1623	.44
	P1	6	.2215	.06003	.02451	.1585	.2845	.13
	P2	6	.2685	.06218	.02538	.2032	.3338	.18
	P3	6	.2812	.13909	.05678	.1352	.4271	.12
	Total	24	.3749	.29493	.06020	.2504	.4995	.12
								1.54

**ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.
konsentrasi	Between Groups	1.012	3	.337	6.825
	Within Groups	.989	20	.049	.002
	Total	2.001	23		

### Multiple Comparisons

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
konsentrasi	LSD	P0	.50700*	.12836	.001	.2393	.7747
		P2	.46000*	.12836	.002	.1923	.7277
		P3	.44733*	.12836	.002	.1796	.7151
	P1	P0	-.50700*	.12836	.001	-.7747	-.2393
		P2	-.04700	.12836	.718	-.3147	.2207
		P3	-.05967	.12836	.647	-.3274	.2081
	P2	P0	-.46000*	.12836	.002	-.7277	-.1923
		P1	.04700	.12836	.718	-.2207	.3147
		P3	-.01267	.12836	.922	-.2804	.2551
	P3	P0	-.44733*	.12836	.002	-.7151	-.1796
		P1	.05967	.12836	.647	-.2081	.3274
		P2	.01267	.12836	.922	-.2551	.2804

\*. The mean difference is significant at the 0.05 level.

### Konsentrasi

perlakuan	N	Subset for alpha = 0.05	
		1	2
Duncan <sup>a</sup>	P1	6	.2215
	P2	6	.2685
	P3	6	.2812
	P0	6	.7285
	Sig.		.666      1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 5. Hasil Analisis Perhitungan Sidik Ragam Viabilitas X

**Descriptives**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
viabilitas	P0	6	91.8050	2.77641	1.13347	88.8913	94.7187	88.06
	P1	6	83.3600	7.76477	3.16995	78.6814	94.9786	74.03
	P2	6	79.9450	6.64645	2.71340	79.0700	93.0200	77.34
	P3	6	78.7800	6.64792	2.71400	75.6534	89.6066	75.50
	Total	24	86.8275	6.72404	1.37254	83.9882	89.6668	74.03
								95.12

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
viabilitas	Between Groups	258.041	3	86.014	2.200	.120
	Within Groups	781.851	20	39.093		
	Total	1039.892	23			

### Multiple Comparisons

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
viabilitas	LSD P0	P1	4.97500	3.60983	.183	-2.5550	12.5050
		P2	5.76000	3.60983	.126	-1.7700	13.2900
		P3	9.17500*	3.60983	.019	1.6450	16.7050
	P1	P0	-4.97500	3.60983	.183	-12.5050	2.5550
		P2	.78500	3.60983	.830	-6.7450	8.3150
		P3	4.20000	3.60983	.258	-3.3300	11.7300
	P2	P0	-5.76000	3.60983	.126	-13.2900	1.7700
		P1	-.78500	3.60983	.830	-8.3150	6.7450
		P3	3.41500	3.60983	.355	-4.1150	10.9450
	P3	P0	-9.17500*	3.60983	.019	-16.7050	-1.6450
		P1	-4.20000	3.60983	.258	-11.7300	3.3300
		P2	-3.41500	3.60983	.355	-10.9450	4.1150

\*. The mean difference is significant at the 0.05 level.

### Viabilitas

perlakuan	N	Subset for alpha = 0.05	
		1	2
Duncan <sup>a</sup>	P0	6	91.8050
	P1	6	83.3600
	P2	6	79.9450
	P3	6	78.7800
	Sig.		.284 .146

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 6. Hasil Analisis Perhitungan Sidik Ragam Viabilitas Y

**Descriptives**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
viabilitas	P0	6	91.8050	2.77641	1.13347	88.8913	94.7187	88.06
	P1	6	71.2867	13.04672	5.32630	63.9150	91.2984	54.00
	P2	6	64.0533	7.12714	2.90964	72.7839	87.7428	72.77
	P3	6	60.5550	9.42675	3.84845	65.5422	85.3278	61.95
	Total	24	81.2775	10.51857	2.14709	76.8359	85.7191	54.00
								95.12

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
viabilitas	Between Groups	956.800	3	318.933	4.017	.022
	Within Groups	1587.926	20	79.396		
	Total	2544.726	23			

### Multiple Comparisons

Dependent Variable	(I)	(J)	Mean		Sig.	95% Confidence Interval	
			perlakuan	perlakuan		Lower Bound	Upper Bound
viabilitas	LSD	P0	P1	14.19833*	.012	3.4672	24.9295
			P2	11.54167*	.036	.8105	22.2728
			P3	16.37000*	.005	5.6389	27.1011
	P1	P0	P1	-14.19833*	.012	-24.9295	-3.4672
			P2	-2.65667	.611	-13.3878	8.0745
			P3	2.17167	.677	-8.5595	12.9028
	P2	P0	P1	-11.54167*	.036	-22.2728	-.8105
			P1	2.65667	.611	-8.0745	13.3878
			P3	4.82833	.359	-5.9028	15.5595
	P3	P0	P0	-16.37000*	.005	-27.1011	-5.6389
			P1	-2.17167	.677	-12.9028	8.5595
			P2	-4.82833	.359	-15.5595	5.9028

\*. The mean difference is significant at the 0.05 level.

### Viabilitas

perlakuan	N	Subset for alpha = 0.05	
		1	2
Duncan <sup>a</sup>			
P0	6	91.8050	
P1	6	71.2867	
P2	6	64.0533	
P3	6		60.5550
Sig.		.386	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 7. Hasil Analisis Perhitungan Sidik Ragam Abnormalitas X

**Descriptives**

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
abnormalitas	P0	6	5.9833	2.43648	.99469	3.4264	8.5403	3.98	10.50
	P1	6	7.9300	2.01442	.82238	5.8160	10.0440	4.88	10.45
	P2	6	9.5517	1.92216	.78472	7.5345	11.5688	6.47	11.94
	P3	6	10.4333	2.86490	1.16959	7.4268	13.4399	7.50	15.35
	Total	24	8.4746	2.78569	.56863	7.2983	9.6509	3.98	15.35

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
abnormalitas	Between Groups	68.998	3	22.999	4.201	.019
	Within Groups	109.483	20	5.474		
	Total	178.482	23			

### Multiple Comparisons

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
abnormalitas	LSD P0	P1	-1.94667	1.35082	.165	-4.7644	.8711
		P2	-3.56833*	1.35082	.016	-6.3861	-.7506
		P3	-4.45000*	1.35082	.004	-7.2678	-1.6322
	P1	P0	1.94667	1.35082	.165	-.8711	4.7644
		P2	-1.62167	1.35082	.244	-4.4394	1.1961
		P3	-2.50333	1.35082	.079	-5.3211	.3144
	P2	P0	3.56833*	1.35082	.016	.7506	6.3861
		P1	1.62167	1.35082	.244	-1.1961	4.4394
		P3	-.88167	1.35082	.521	-3.6994	1.9361
	P3	P0	4.45000*	1.35082	.004	1.6322	7.2678
		P1	2.50333	1.35082	.079	-.3144	5.3211
		P2	.88167	1.35082	.521	-1.9361	3.6994

\*. The mean difference is significant at the 0.05 level.

### Abnormalitas

perlakuan	N	Subset for alpha = 0.05	
		1	2
Duncan <sup>a</sup>	P0	6	5.9833
	P1	6	7.9300
	P2	6	9.5517
	P3	6	10.4333
	Sig.		.094

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 8. Hasil Analisis Perhitungan Sidik Ragam Abnormalitas Y

**Descriptives**

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
abnormalitas	P0	6	5.9833	2.43648	.99469	3.4264	8.5403	3.98	10.50
	P1	6	11.0383	2.97361	1.21397	7.9177	14.1589	7.96	14.85
	P2	6	12.9617	2.80756	1.14618	10.0153	15.9080	9.41	15.92
	P3	6	13.9100	2.53060	1.03311	11.2543	16.5657	10.45	17.41
	Total	24	10.9733	4.01203	.81895	9.2792	12.6675	3.98	17.41

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
abnormalitas	Between Groups	224.891	3	74.964	10.317	.000
	Within Groups	145.325	20	7.266		
	Total	370.216	23			

### Multiple Comparisons

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
abnormalitas	LSD	P0	-5.05500*	1.55631	.004	-8.3014	-1.8086
		P2	-6.97833*	1.55631	.000	-10.2247	-3.7319
		P3	-7.92667*	1.55631	.000	-11.1731	-4.6803
	P1	P0	5.05500*	1.55631	.004	1.8086	8.3014
		P2	-1.92333	1.55631	.231	-5.1697	1.3231
		P3	-2.87167	1.55631	.080	-6.1181	.3747
	P2	P0	6.97833*	1.55631	.000	3.7319	10.2247
		P1	1.92333	1.55631	.231	-1.3231	5.1697
		P3	-.94833	1.55631	.549	-4.1947	2.2981
	P3	P0	7.92667*	1.55631	.000	4.6803	11.1731
		P1	2.87167	1.55631	.080	-.3747	6.1181
		P2	.94833	1.55631	.549	-2.2981	4.1947

\*. The mean difference is significant at the 0.05 level.

### Abnormalitas

	perlakuan	N	Subset for alpha = 0.05	
			1	2
Duncan <sup>a</sup>	P0	6	5.9833	
	P1	6		11.0383
	P2	6		12.9617
	P3	6		13.9100
	Sig.		1.000	.095

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 9. Hasil Analisis Perhitungan Sidik Ragam MPU X

**Descriptives**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
MPU	P0	6	96.6433	2.58199	1.05409	88.6237	94.0430	88.00
	P1	6	87.0000	4.09878	1.67332	83.6986	92.3014	82.00
	P2	6	84.5033	4.66548	1.90467	80.9372	90.7295	80.00
	P3	6	80.8167	7.52773	3.07318	70.7668	86.5665	68.00
	Total	24	85.9583	6.68209	1.36398	83.1367	88.7799	68.00
								95.00

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
MPU	Between Groups	517.458	3	172.486	6.771	.002
	Within Groups	509.500	20	25.475		
	Total	1026.958	23			

### Multiple Comparisons

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
MPU	LSD	P0	3.33333	2.91405	.266	-2.7453	9.4119
		P2	5.50000	2.91405	.074	-.5786	11.5786
		P3	12.66667*	2.91405	.000	6.5881	18.7453
	P1	P0	-3.33333	2.91405	.266	-9.4119	2.7453
		P2	2.16667	2.91405	.466	-3.9119	8.2453
		P3	9.33333	2.91405	.004	3.2547	15.4119
	P2	P0	-5.50000	2.91405	.074	-11.5786	.5786
		P1	-2.16667	2.91405	.466	-8.2453	3.9119
		P3	7.16667	2.91405	.023	1.0881	13.2453
	P3	P0	-12.66667*	2.91405	.000	-18.7453	-6.5881
		P1	-9.33333*	2.91405	.004	-15.4119	-3.2547
		P3	-7.16667*	2.91405	.023	-13.2453	-1.0881

\*. The mean difference is significant at the 0.05 level.

### MPU

	perlakuan	N	Subset for alpha = 0.05	
			1	2
Duncan <sup>a</sup>	P0	6		96.6433
	P1	6		87.0000
	P2	6		84.5033
	P3	6	80.8167	
	Sig.		1.000	.088

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 10. Hasil Analisis Perhitungan Sidik Ragam MPU Y

**Descriptives**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
MPU	P0	6	96.6433	2.58199	1.05409	88.6237	94.0430	88.00
	P1	6	80.6400	9.39681	3.83623	68.6387	88.3613	67.00
	P2	6	80.2400	7.91833	3.23265	70.1902	86.8098	69.00
	P3	6	71.4533	5.77639	2.35820	63.7714	75.8953	63.00
	Total	24	79.5417	10.14666	2.07118	75.2571	83.8262	63.00
								95.00

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
MPU	Between Groups	1412.792	3	470.931	9.861	.000
	Within Groups	955.167	20	47.758		
	Total	2367.958	23			

### Multiple Comparisons

Dependent Variable	(I) perlakuan	(J) perlakuan	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
MPU	LSD P0	P1	12.83333 *	3.98992	.004	4.5105	21.1562
		P2	12.83333 *	3.98992	.004	4.5105	21.1562
		P3	21.50000 *	3.98992	.000	13.1772	29.8228
	P1	P0	-12.83333 *	3.98992	.004	-21.1562	-4.5105
		P2	.00000	3.98992	1.000	-8.3228	8.3228
		P3	8.66667 *	3.98992	.042	.3438	16.9895
	P2	P0	-12.83333 *	3.98992	.004	-21.1562	-4.5105
		P1	.00000	3.98992	1.000	-8.3228	8.3228
		P3	8.66667 *	3.98992	.042	.3438	16.9895
	P3	P0	-21.50000 *	3.98992	.000	-29.8228	-13.1772
		P1	-8.66667 *	3.98992	.042	-16.9895	-.3438
		P2	-8.66667 *	3.98992	.042	-16.9895	-.3438

\*. The mean difference is significant at the 0.05 level.

### MPU

perlakuan	N	Subset for alpha = 0.05	
		1	2
Duncan <sup>a</sup>	P0	6	96.6433
	P1	6	80.6400
	P2	6	80.2400
	P3	6	71.4533
	Sig.		.052 1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 11. Hasil Analisis Perhitungan Sidik Ragam TAU X

**Descriptives**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
TAU	P0	6	91.0667	3.14113	1.28236	87.3703	93.9631	87.00	94.00
	P1	6	87.0300	4.59347	1.87528	81.6794	91.3206	78.00	90.00
	P2	6	85.4600	5.69210	2.32379	79.0265	90.9735	78.00	91.00
	P3	6	82.1933	3.54495	1.44722	78.1131	85.5535	77.00	85.00
	Total	24	86.0000	5.20033	1.06151	83.8041	88.1959	77.00	94.00

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
TAU	Between Groups	242.333	3	80.778	4.255	.018
	Within Groups	379.667	20	18.983		
	Total	622.000	23			

### Multiple Comparisons

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound
TAU	LSD	P0	4.16667	2.51551	.113	-1.0806	9.4139
		P2	5.66667*	2.51551	.036	.4194	10.9139
		P3	8.83333*	2.51551	.002	3.5861	14.0806
	P1	P0	-4.16667	2.51551	.113	-9.4139	1.0806
		P2	1.50000	2.51551	.558	-3.7473	6.7473
		P3	4.66667	2.51551	.078	-.5806	9.9139
	P2	P0	-5.66667*	2.51551	.036	-10.9139	-.4194
		P1	-1.50000	2.51551	.558	-6.7473	3.7473
		P3	3.16667	2.51551	.223	-2.0806	8.4139
	P3	P0	-8.83333*	2.51551	.002	-14.0806	-3.5861
		P1	-4.66667	2.51551	.078	-9.9139	.5806
		P3	-3.16667	2.51551	.223	-8.4139	2.0806

\*. The mean difference is significant at the 0.05 level.

### TAU

perlakuan	N	Subset for alpha = 0.05	
		1	2
Duncan <sup>a</sup>	6		91.0667
	6	87.0300	87.0300
	6	85.4600	
	6	82.1933	
	Sig.	.093	.113

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 12. Hasil Analisis Perhitungan Sidik Ragam TAU Y

**Descriptives**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
TAU	P0	6	91.0667	3.14113	1.28236	87.3703	93.9631	87.00
	P1	6	77.0933	6.94022	2.83333	69.5500	84.1166	69.00
	P2	6	73.6867	4.53505	1.85143	68.4074	77.9259	70.00
	P3	6	72.1167	5.98888	2.44495	65.3817	77.9516	64.00
	Total	24	78.0833	9.14576	1.86687	74.2214	81.9452	64.00
								78.0833

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
TAU	Between Groups	1351.500	3	450.500	15.743	.000
	Within Groups	572.333	20	28.617		
	Total	1923.833	23			

### Multiple Comparisons

Dependent Variable	(I) perlakuan	(J) perlakuan	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
TAU	LSD P0	P1	13.83333 *	3.08851	.000	7.3908	20.2759
		P2	17.50000 *	3.08851	.000	11.0575	23.9425
		P3	19.00000 *	3.08851	.000	12.5575	25.4425
	P1	P0	-13.83333 *	3.08851	.000	-20.2759	-7.3908
		P2	3.66667	3.08851	.249	-2.7759	10.1092
		P3	5.16667	3.08851	.110	-1.2759	11.6092
	P2	P0	-17.50000 *	3.08851	.000	-23.9425	-11.0575
		P1	-3.66667	3.08851	.249	-10.1092	2.7759
		P3	1.50000	3.08851	.632	-4.9425	7.9425
	P3	P0	-19.00000 *	3.08851	.000	-25.4425	-12.5575
		P1	-5.16667	3.08851	.110	-11.6092	1.2759
		P3	-1.50000	3.08851	.632	-7.9425	4.9425

\*. The mean difference is significant at the 0.05 level.

### TAU

	perlakuan	N	Subset for alpha = 0.05	
			1	2
Duncan <sup>a</sup>	P0	6	91.0667	
	P1	6	77.0933	
	P2	6	73.6867	
	P3	6		72.1167
	Sig.		.128	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

Lampiran 13. Hasil Uji Descriptive statistic Proporsi X dan Y

<b>S+P</b>				
Spermatozoa	Panjang	Proporsi	Lebar	Proporsi
X	99	49,50	93	46,04
Y	103	51,50	99	49,01
R	0	0,00	10	4,95
Total	202	101	202	100

<b>S30 X</b>				
Spermatozoa	Panjang	Proporsi	Lebar	Proporsi
X	84	42,00	114	56,44
Y	73	36,50	84	41,58
R	45	22,28	4	1,98
Total	202	100,7772	202	100

<b>S30 Y</b>				
Spermatozoa	Panjang	Proporsi	Lebar	Proporsi
X	15	7,43	5	2,48
Y	186	92,08	195	96,53
R	1	0,50	2	0,99
Total	202	100	202	100

### S45 X

Spermatozoa	Panjang	Proporsi	Lebar	Proporsi
X	59	29,21	48	23,76
Y	134	66,34	142	70,30
R	9	4,46	12	5,94
Total	202	100	202	100

### S45 Y

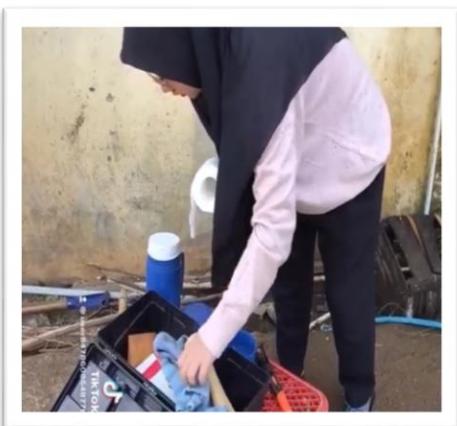
Spermatozoa	Panjang	Proporsi	Lebar	Proporsi
X	41	20,30	12	5,94
Y	143	70,79	184	91,09
R	18	8,91	6	2,97
Total	202	100	202	100

### S60 X

Spermatozoa	Panjang	Proporsi	Lebar	Proporsi
X	101	50,00	94	46,53
Y	93	46,04	92	45,54
R	8	3,96	16	7,92
Total	202	100	202	100

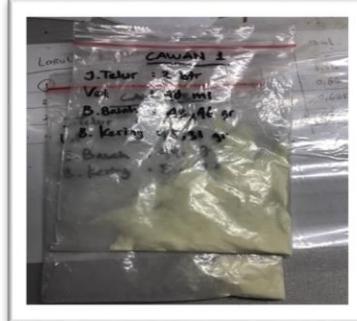
### S60 Y

Spermatozoa	Panjang	Proporsi	Lebar	Proporsi
X	35	17,33	29	14,36
Y	156	77,23	170	84,16
R	11	5,45	3	1,49
Total	202	100	202	100

**DOKUMENTASI PENELITIAN**

**PENAMPUNGAN SEMEN**

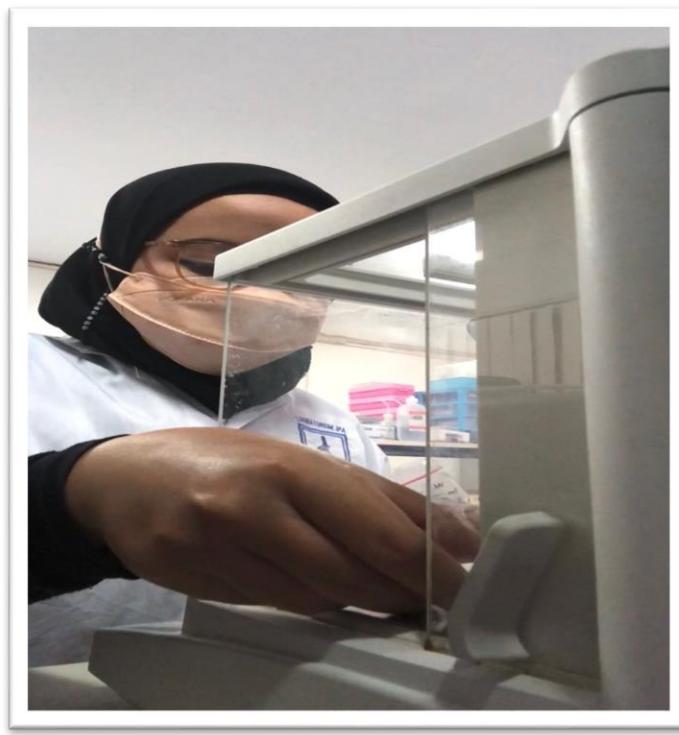
## DOKUMENTASI PENELITIAN



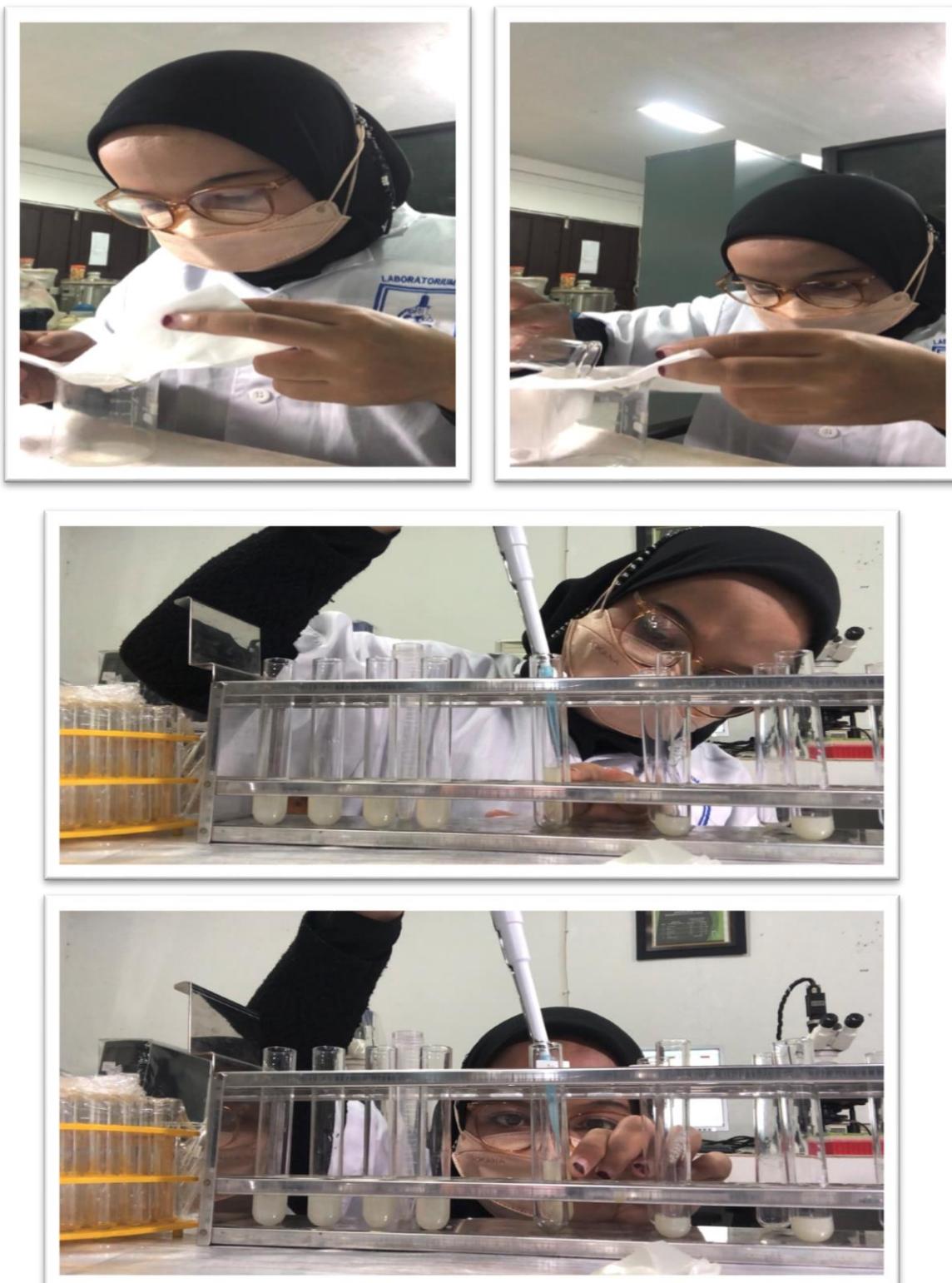
**PERSIAPAN ALAT DAN BAHAN**

**DOKUMENTASI PENELITIAN**

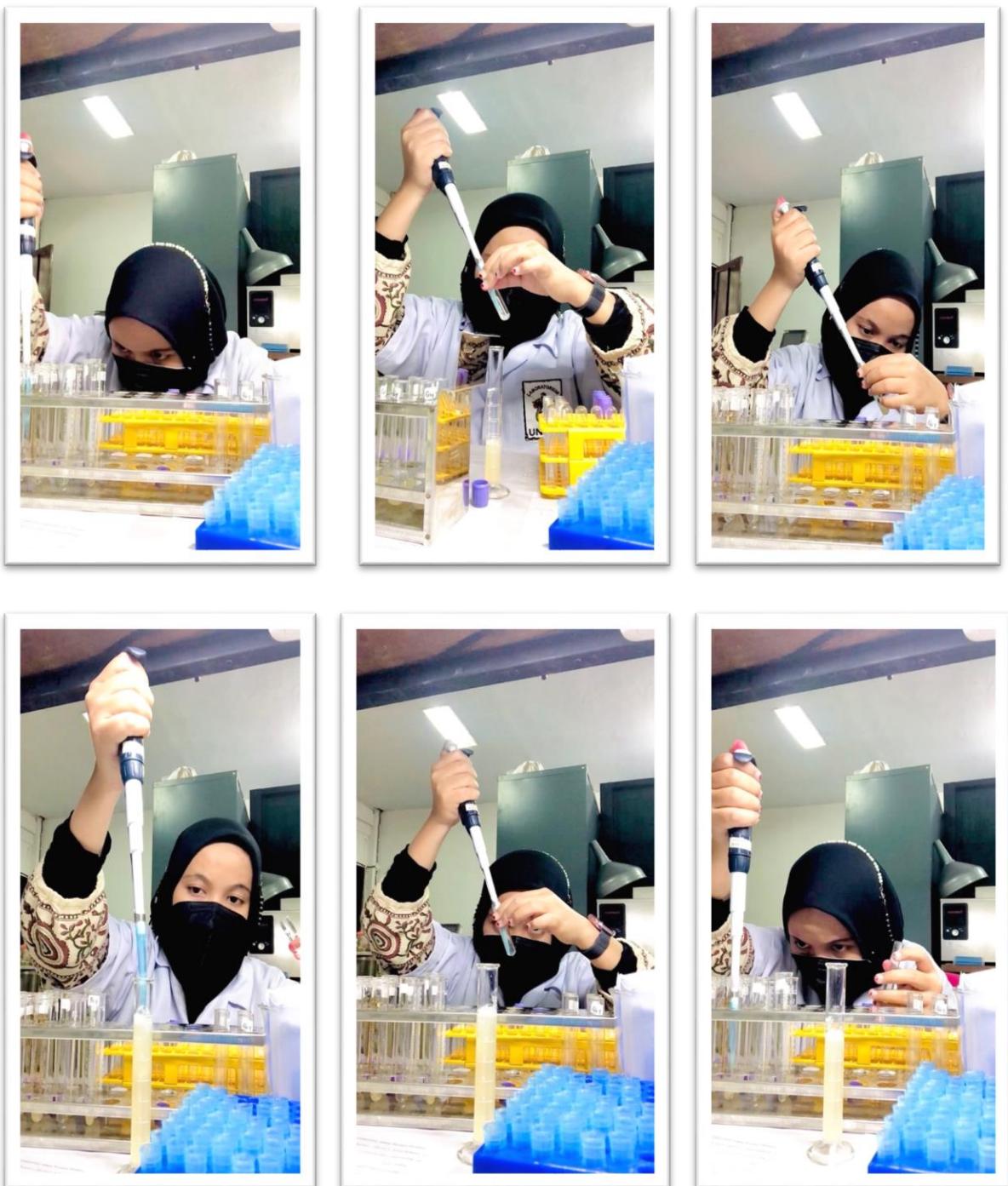
**STERILISASI ALAT**

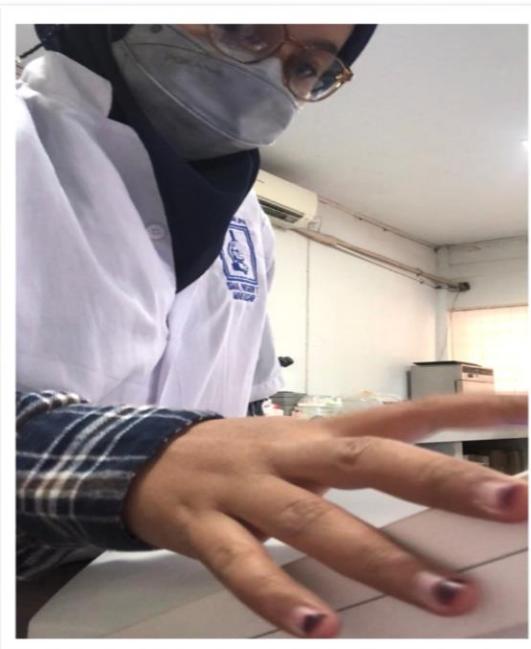
**DOKUMENTASI PENELITIAN**

**PENIMBANGAN BUBUK FREEZE DRY**

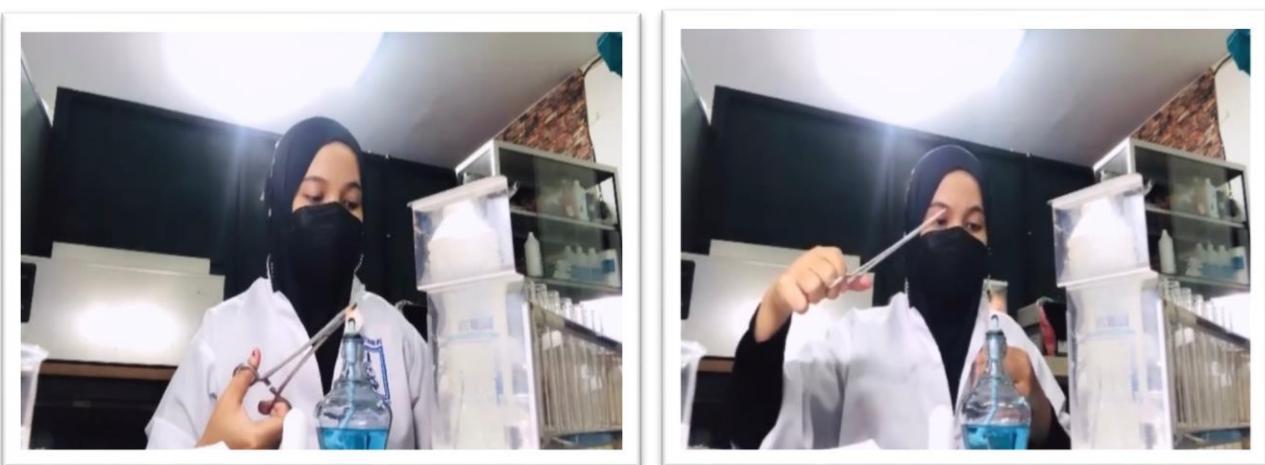
**DOKUMENTASI PENELITIAN**

**PENYARINGAN LARUTAN FREEZEDRY DAN  
PEMBUTAN FRAKSI BAWAH, TENGAH, DAN FRAKSI ATAS**

**DOKUMENTASI PENELITIAN****SEXING SEMEN SPERMATOZOA**



MENGHITUNG KONSENTRASI SEMEN



**MEMASUKKAN SEMEN HASIL SEXING KEDALAM STRAW**

## RIWAYAT PENULIS



**PUTRI DAMAYANTI**, Lahir pada tanggal 01 Agustus 1997 di Kota Parepare, Provinsi Sulawesi Selatan. Anak ketiga dari 3 bersaudara dan terlahir dari pasangan H.Ali Tibu dan Hj. Andi. Mattingara Hamid. Jenjang pendidikan yang ditempuh yaitu, Sekolah Dasar Negeri 79 Parepare (penulis aktif di organisasi Pramuka) , hingga lulus Tahun 2008.

Melanjutkan pendidikan di Sekolah Menengah Pertama yaitu SMP Negeri SMP Negeri 13 Makassar (penulis aktif dalam pengurus OSIS sebagai Sekretaris dan menjadi ketua kelas 2 tahun lamanya) hingga lulus pada Tahun 2011. Kemudian melanjutkan pendidikan ke jenjang Sekolah Menengah Atas di SMA Negeri 12 Makassar, (penulis aktif menjadi anggota OSIS, dan sebagai sekertaris organisasi RCL Remaja Cinta Lingkungan) hingga lulus pada tahun 2014. Selanjutnya, diterima mengikuti pendidikan di Sekolah Tinggi Penyuluhan Pertanian (STPP) Gowa pada tahun 2014 pada jurusan Penyuluhan Peternakan. (Penulis aktif dalam organisasi Badan Eksekutif Mahasiswa (BEM) periode 2015 - 2016 dan selanjutnya periode 2016 - 2017 penulis aktif di organisasi Badan Pengawasan Mahasiswa) hingga lulus pada tahun 2018. Kemudian penulis melanjutkan pendidikan kejenjang Strata 2 (S2) di Universitas Hasanuddin Makassar Jurusan Ilmu dan Teknologi Peternakan pada tahun 2019 dan lulus pada tahun 2022.