

## DAFTAR PUSTAKA

- Abdelazeim, S. A., Shehata, N. I., & Aly, H. F. (2020). Amelioration of oxidative stress - mediated apoptosis in copper oxide nanoparticles - induced liver injury in rats by potent antioxidants. *Scientific Reports*, 0123456789, 1–14. <https://doi.org/10.1038/s41598-020-67784-y>
- Abdelazeim, S. A., Shehata, N. I., Aly, H. F., & Shams, S. G. E. (2020). Amelioration of oxidative stress-mediated apoptosis in copper oxide nanoparticles-induced liver injury in rats by potent antioxidants. *Scientific Reports*, 10(1), 10812. <https://doi.org/10.1038/s41598-020-67784-y>
- Al-Shobaili, H. A., Alzolibani, A. A., al Robaee, A. A., Meki, A. R. M. A., & Rasheed, Z. (2013). Biochemical Markers of Oxidative and Nitrosative Stress in Acne Vulgaris: Correlation With Disease Activity. *Journal of Clinical Laboratory Analysis*, 27(1), 45–52. <https://doi.org/10.1002/jcla.21560>
- Anggraeni, S., Setyaningrum, T., & Listiawan, M. Y. (2017). Perbedaan Kadar Malondialdehid (MDA) sebagai Petanda Stres Oksidatif pada Berbagai Derajat Akne Vulgaris. *Periodical of Dermatology and Venerology*, 29(1), 36–43.
- Austin, E. D., Lahm, T., West, J., Tofovic, S. P., Johansen, A. K., MacLean, M. R., Alzoubi, A., & Oka, M. (2013). Gender, sex hormones and pulmonary hypertension. *Pulmonary Circulation*, 3(2), 294–314. <https://doi.org/10.4103/2045-8932.114756>
- Benowitz, N. L., & Burbank, A. D. (2016). Cardiovascular toxicity of nicotine: Implications for electronic cigarette use. In *Trends in Cardiovascular Medicine* (Vol. 26, Issue 6, pp. 515–523). Elsevier Inc. <https://doi.org/10.1016/j.tcm.2016.03.001>
- Boehm, R. E., do Nascimento, S. N., Cohen, C. R., Bandiera, S., Pulcinelli, R. R., Balsan, A. M., Fao, N. S., Peruzzi, C., Garcia, S. C., Sekine, L., Onsten, T. G. H., & Gomez, R. (2020). Cigarette smoking and antioxidant defences in packed red blood cells prior to storage. *Blood Transfusion = Trasfusione Del Sangue*, 18(1), 40–48. <https://doi.org/10.2450/2019.0166-19>
- Bosse, Y. (2014). *Endocrine regulation of airway contractility is overlooked*. <https://doi.org/10.1530/JOE-14-0220>
- Budani, M. C., & Tiboni, G. M. (2021). Novel insights on the role of nitric oxide in the ovary: A review of the literature. *International Journal of Environmental Research and Public Health*, 18(3), 1–19. <https://doi.org/10.3390/ijerph18030980>
- Choi, J. H., Jang, M., Kim, E. J., Lee, M. J., Park, K. S., Kim, S. H., In, J. G., Kwak, Y. S., Park, D. H., Cho, S. S., Nah, S. Y., Cho, I. H., & Bae, C. S. (2020). Korean Red Ginseng alleviates dehydroepiandrosterone-induced polycystic ovarian syndrome in rats via its antiinflammatory and antioxidant activities. *Journal of Ginseng Research*, 44(6), 790–798. <https://doi.org/10.1016/j.jgr.2019.08.007>

- Cyr, A. R., Huckaby, L. v., Shiva, S. S., & Zuckerbraun, B. S. (2020). Nitric Oxide and Endothelial Dysfunction. *Critical Care Clinics*, 36(2), 307–321. <https://doi.org/10.1016/j.ccc.2019.12.009>
- D. Hall, E., & K. Andrus, P. (2000). Measurement of Oxygen Radicals and Lipid Peroxidation in Neural Tissues. *Current Protocols in Neuroscience*, 11, 7.17.1-7.17.35.
- Daiber, A., Steven, S., Weber, A., Shuvaev, V. v, Muzykantov, V. R., Laher, I., Li, H., Lamas, S., & Münzel, T. (2017). Targeting vascular (endothelial) dysfunction. *British Journal of Pharmacology*, 174(12), 1591–1619. <https://doi.org/10.1111/bph.13517>
- de Carlos, S. P., Dias, A. S., Forgiarini Júnior, L. A., Patricio, P. D., Graciano, T., Nesi, R. T., Valença, S., Chiappa, A. M. G., Cipriano, G., de Souza, C. T., & Chiappa, G. R. da S. (2014). Oxidative damage induced by cigarette smoke exposure in mice: impact on lung tissue and diaphragm muscle. *Jornal Brasileiro de Pneumologia*, 40(4), 411–420. <https://doi.org/10.1590/S1806-37132014000400009>
- Dikalov, S., Itani, H., Richmond, B., Vergeade, A., Rahman, S. M. J., Boutaud, O., Blackwell, T., Massion, P. P., Harrison, D. G., & Dikalova, A. (2019). Tobacco smoking induces cardiovascular mitochondrial oxidative stress, promotes endothelial dysfunction, and enhances hypertension. *American Journal of Physiology. Heart and Circulatory Physiology*, 316(3), H639–H646. <https://doi.org/10.1152/ajpheart.00595.2018>
- Ding, X., Yu, L., Ge, C., & Ma, H. (2017). Protective effect of DHEA on hydrogen peroxide-induced oxidative damage and apoptosis in primary rat Leydig cells. In *Oncotarget* (Vol. 8, Issue 10). [www.impactjournals.com/oncotarget/](http://www.impactjournals.com/oncotarget/)
- Djordjević, A., Kotnik, P., Horvat, D., Knez, Ž., & Antonič, M. (2020). Pharmacodynamics of malondialdehyde as indirect oxidative stress marker after arrested-heart cardiopulmonary bypass surgery. *Biomedicine & Pharmacotherapy*, 132, 110877. <https://doi.org/https://doi.org/10.1016/j.biopha.2020.110877>
- Dumas De La Roque, E., Quignard, J. F., Ducret, T., Dahan, D., Courtois, A., Begueret, H., Marthan, R., & Savineau, J. P. (2013). Beneficial effect of dehydroepiandrosterone on pulmonary hypertension in a rodent model of pulmonary hypertension in infants. *Pediatric Research*, 74(2), 163–169. <https://doi.org/10.1038/pr.2013.73>
- El-Sakka, A. I. (2018). Dehydroepiandrosterone and Erectile Function: A Review. *World J Mens Health*, 36(3), 183–191. <https://doi.org/10.5534/wjmh.180005>
- Favero, G., Paganelli, C., Buffoli, B., Rodella, L. F., & Rezzani, R. (2014). Endothelium and its alterations in cardiovascular diseases: life style intervention. *BioMed Research International*, 2014, 801896. <https://doi.org/10.1155/2014/801896>
- Gallo, M., Aragno, M., Gatto, V., Tamagno, E., Brignardello, E., Manti, R., Danni, O., & Boccuzzi, G. (1999). Protective effect of dehydroepiandrosterone

- against lipid peroxidation in a human liver cell line. *European Journal of Endocrinology*, 141, 35–39. <http://www.eje.org>
- Ganesha, I. G. H., Linawati, N. M., & Satriyasa, B. K. (2020). Pemberian Ekstrak Etanol Kubis Ungu (*Brassica oleraceae* L.) Menurunkan Kadar Malondialdehid dan Jumlah Makrofag Jaringan Paru Tikus yang Terpapar Asap Rokok. *Jurnal Ilmiah Medicamento*, 6(1). <https://doi.org/10.36733/medicamento.v6i1.714>
- Gimbrone, M. A., & García-Cardeña, G. (2016). Endothelial Cell Dysfunction and the Pathobiology of Atherosclerosis. *Circulation Research*, 118(4), 620–636. <https://doi.org/10.1161/CIRCRESAHA.115.306301>
- Goshi, E., Zhou, G., & He, Q. (2019). Nitric oxide detection methods in vitro and in vivo. *Medical Gas Research*, 9(4), 192–207. <https://doi.org/10.4103/2045-9912.273957>
- Izumo, K., Horiuchi, M., Komatsu, M., Aoyama, K., Bandow, K., Matsuguchi, T., Takeuchi, M., & Takeuchi, T. (2009). Dehydroepiandrosterone increased oxidative stress in a human cell line during differentiation. *Free Radical Research*, 43(10), 922–931. <https://doi.org/10.1080/10715760903137093>
- Jacob, M. H. V. M., Janner, D. D. R., Jahn, M. P., Kucharski, L. C., Belló-Klein, A., & Ribeiro, M. F. M. (2010). Age-related effects of DHEA on peripheral markers of oxidative stress. *Cell Biochemistry and Function*, 28(1), 52–57. <https://doi.org/10.1002/cbf.1619>
- Jacob, M. H. V. M., Janner, D. da R., Belló-Klein, A., Llesuy, S. F., & Ribeiro, M. F. M. (2008). Dehydroepiandrosterone modulates antioxidant enzymes and Akt signaling in healthy Wistar rat hearts. *Journal of Steroid Biochemistry and Molecular Biology*, 112(1–3), 138–144. <https://doi.org/10.1016/j.jsbmb.2008.09.008>
- Jelic, M. D., Mandic, A. D., Maricic, S. M., & Srdjenovic, B. U. (2021). Oxidative stress and its role in cancer. *Journal of Cancer Research and Therapeutics*, 17(1), 22–28. [https://doi.org/10.4103/jcrt.JCRT\\_862\\_16](https://doi.org/10.4103/jcrt.JCRT_862_16)
- Joshi, B., Singh, S., Sharma, P., Mohapatra, T., & Kumar, P. (2020). Effect of Cigarette Smoking on Selected Antioxidant Enzymes and Oxidative Stress Biomarkers. *Journal of Clinical and Diagnosis Research*. <https://doi.org/10.7860/jcdr/2020/45948.14138>
- Kadek, N., Anggarani, N., Djoko, D. J., & Juswono, U. P. (2020). Identifikasi Radikal Bebas Pada Asap Utama Rokok Dengan Campuran Cengkeh (Kretek) Dan Rokok Tanpa Campuran Cengkeh (Putih). *Buletin Fisika*, 21(2), 73–81.
- Kamceva, G., Arsova-Sarafinovska, Z., Ruskovska, T., Zdravkovska, M., Kamceva-Panova, L., & Stikova, E. (2016). Cigarette Smoking and Oxidative Stress in Patients with Coronary Artery Disease. *Open Access Macedonian Journal of Medical Sciences*, 4(4), 636–640. <https://doi.org/10.3889/oamjms.2016.117>

- Kasperska-zajac, A. (2010). *Asthma and Dehydroepiandrosterone ( DHEA ) : Facts and Hypotheses*. 33(5), 320–324. <https://doi.org/10.1007/s10753-010-9188-1>
- Khan, F. H., Dervan, E., Bhattacharyya, D. D., McAuliffe, J. D., Miranda, K. M., & Glynn, S. A. (2020). The Role of Nitric Oxide in Cancer: Master Regulator or NOT? *International Journal of Molecular Sciences*, 21(24), 9393. <https://doi.org/10.3390/ijms21249393>
- Kiersztan, A., Gaanga, K., Witecka, A., & Jagielski, A. K. (2021). DHEA-pretreatment attenuates oxidative stress in kidney-cortex and liver of diabetic rabbits and delays development of the disease. *Biochimie*, 185, 135–145. <https://doi.org/10.1016/j.biochi.2021.03.010>
- Kole, E., Ozkan, S. O., Eraldemir, C., Akar, F. Y., Ozbek, S. K., Kole, M. C., Kum, T., & Filiz, P. C. (2019). Effects of melatonin on ovarian reserve in cigarette smoking: an experimental study. *Archives of Medical Science : AMS*, 16(6), 1376–1386. <https://doi.org/10.5114/aoms.2019.89409>
- Konstantinou, G. N. (2017). Enzyme-linked immunosorbent assay (ELISA). In *Methods in Molecular Biology* (Vol. 1592, pp. 79–94). Humana Press Inc. [https://doi.org/10.1007/978-1-4939-6925-8\\_7](https://doi.org/10.1007/978-1-4939-6925-8_7)
- Kurniawan, A., & Yanni, M. (2020). Pemeriksaan Fungsi Endotel Pada Penyakit Kardiovaskular. *Journal Human Care*, 5(3), 638–649.
- Li, J., Liu, S., Cao, G., Sun, Y., Chen, W., Dong, F., Xu, J., Zhang, C., & Zhang, W. (2018). Nicotine induces endothelial dysfunction and promotes atherosclerosis via GTPCH1. *Journal of Cellular and Molecular Medicine*, 22(11), 5406–5417. <https://doi.org/10.1111/jcmm.13812>
- Li, Y., Zheng, Q., Sun, D., Cui, X., Chen, S., Bulbul, A., Liu, S., & Yan, Q. (2019). Dehydroepiandrosterone stimulates inflammation and impairs ovarian functions of polycystic ovary syndrome. *Journal of Cellular Physiology*, 234(5), 7435–7447. <https://doi.org/10.1002/jcp.27501>
- Liu, C., Zhou, M.-S., Li, Y., Wang, A., Chadipiralla, K., Tian, R., & Raji, L. (2017). Oral nicotine aggravates endothelial dysfunction and vascular inflammation in diet-induced obese rats: Role of macrophage TNF $\alpha$ . *PLOS ONE*, 12(12), e0188439-. <https://doi.org/10.1371/journal.pone.0188439>
- Lowry, J. L., Brovkovich, V., Zhang, Y., & Skidgel, R. A. (2013). Endothelial nitric-oxide synthase activation generates an inducible nitric-oxide synthase-like output of nitric oxide in inflamed endothelium. *Journal of Biological Chemistry*, 288(6), 4174–4193. <https://doi.org/10.1074/jbc.M112.436022>
- Mannic, T., Viguie, J., & Rossier, M. F. (2015). In vivo and in vitro evidences of dehydroepiandrosterone protective role on the cardiovascular system. *International Journal of Endocrinology and Metabolism*, 13(2), e24660–e24660. <https://doi.org/10.5812/ijem.24660>
- Mastrocola, R., Aragno, M., Betteto, S., Brignardello, E., Catalano, M. G., Danni, O., & Boccuzzi, G. (2003). Pro-oxidant effect of dehydroepiandrosterone in

rats is mediated by PPAR activation. *Life Sciences*, 73(3), 289–299. [https://doi.org/10.1016/S0024-3205\(03\)00287-X](https://doi.org/10.1016/S0024-3205(03)00287-X)

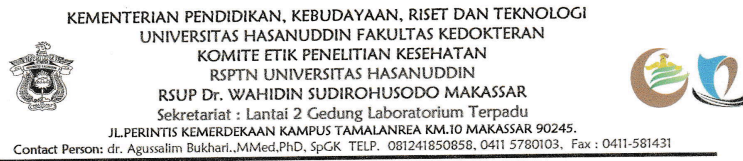
- Medina-Leyte, D. J., Zepeda-García, O., Domínguez-Pérez, M., González-Garrido, A., Villarreal-Molina, T., & Jacobo-Albavera, L. (2021). Endothelial dysfunction, inflammation and coronary artery disease: Potential biomarkers and promising therapeutical approaches. *International Journal of Molecular Sciences*, 22(8). <https://doi.org/10.3390/ijms22083850>
- Meza, C. A., la Favor, J. D., Kim, D.-H., & Hickner, R. C. (2019). Endothelial Dysfunction: Is There a Hyperglycemia-Induced Imbalance of NOX and NOS? *International Journal of Molecular Sciences*, 20(15), 3775. <https://doi.org/10.3390/ijms20153775>
- Mieczkowska, J., Mosiewicz, J., Sak, J., Grzybowski, A., Terlecki, P., Barud, W., Kwaśniewski, W., & Tutka, P. (2012). Effects of cigarette smoking, metabolic syndrome and dehydroepiandrosterone deficiency on intima-media thickness and endothelial function in hypertensive postmenopausal women. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*, 18(4), CR225–CR234. <https://doi.org/10.12659/msm.882622>
- Mimić-Oka, J., Simić, D. v, & Simić, T. P. (1999). Free Radicals in Cardiovascular Diseases. *Medicine and Biology*, 6(1), 11–22. <http://ni.ac.yu/FactaUC612.17>
- Münzel, T., Hahad, O., Kuntic, M., Keaney Jr, J. F., Deanfield, J. E., & Daiber, A. (2020). Effects of tobacco cigarettes, e-cigarettes, and waterpipe smoking on endothelial function and clinical outcomes. *European Heart Journal*, 41(41), 4057–4070. <https://doi.org/10.1093/eurheartj/ehaa460>
- Nolan, M. B., Kemper, K. E., Glynn, T. J., Hurt, R. D., & Hays, J. T. (2018). Tobacco Dependence Treatment Grants: A Collaborative Approach to the Implementation of WHO Tobacco Control Initiatives. *Journal of Environmental and Public Health*, 2018, 8429738. <https://doi.org/10.1155/2018/8429738>
- Oakes, J. M., Xu, J., Morris, T. M., Fried, N. D., Pearson, C. S., Lobell, T. D., Gilpin, N. W., Lazartigues, E., Gardner, J. D., & Yue, X. (2020). Effects of Chronic Nicotine Inhalation on Systemic and Pulmonary Blood Pressure and Right Ventricular Remodeling in Mice. *Hypertension (Dallas, Tex. : 1979)*, 75(5), 1305–1314. <https://doi.org/10.1161/hypertensionaha.119.14608>
- Pan, B., Jin, X., Jun, L., Qiu, S., Zheng, Q., & Pan, M. (2019). The relationship between smoking and stroke: A meta-analysis. *Medicine*, 98(12), e14872–e14872. <https://doi.org/10.1097/MD.00000000000014872>
- Papathanasiou, G., Mamali, A., Papafloratos, S., & Zerva, E. (2014). Effects of Smoking on Cardiovascular Function: The Role of Nicotine and Carbon Monoxide. *Health Science Journal*, 8(2), 247–290.
- Park, K.-H., & Park, W. J. (2015). Endothelial Dysfunction: Clinical Implications in Cardiovascular Disease and Therapeutic Approaches. *Journal of Korean Medical Science*, 30(9), 1213–1225. <https://doi.org/10.3346/jkms.2015.30.9.1213>

- Prakash, C., Mishra, M., Kumar, P., Kumar, V., & Sharma, D. (2019). Dehydroepiandrosterone alleviates oxidative stress and apoptosis in iron-induced epilepsy via activation of Nrf2/ARE signal pathway. *Brain Research Bulletin*, 153, 181–190. <https://doi.org/10.1016/j.brainresbull.2019.08.019>
- Prough, R. A., Clark, B. J., & Klinge, C. M. (2016). *Novel mechanisms for DHEA action*. <https://doi.org/10.1530/JME-16-0013>
- Reitznerová, A., Šuleková, M., Nagy, J., Marcinčák, S., Semjon, B., Čertík, M., & Klemková, T. (2017). Lipid Peroxidation Process in Meat and Meat Products: A Comparison Study of Malondialdehyde Determination between Modified 2-Thiobarbituric Acid Spectrophotometric Method and Reverse-Phase High-Performance Liquid Chromatography. *Molecules (Basel, Switzerland)*, 22(11), 1988. <https://doi.org/10.3390/molecules22111988>
- Salvi, S. (2014). Tobacco smoking and environmental risk factors for chronic obstructive pulmonary disease. In *Clinics in Chest Medicine* (Vol. 35, Issue 1, pp. 17–27). <https://doi.org/10.1016/j.ccm.2013.09.011>
- Savineau, J., Marthan, R., Dumas, E., & Roque, D. (2015). Role of DHEA in cardiovascular diseases. *Biochemical Pharmacology*, 85(6), 718–726. <https://doi.org/10.1016/j.bcp.2012.12.004>
- Savineau, J.-P., Marthan, R., & Dumas d. I. R., E. (2013). Role of DHEA in cardiovascular diseases. *Biochemical Pharmacology*, 85(6), 718–726. <https://doi.org/https://doi.org/10.1016/j.bcp.2012.12.004>
- Schweitzer, K. S., Chen, S. X., Law, S., van Demark, M., Poirier, C., Justice, M. J., Hubbard, W. C., Kim, E. S., Lai, X., Wang, M., Kranz, W. D., Carroll, C. J., Ray, B. D., Bittman, R., Goodpaster, J., Petrache, I., Roudebush, R. L., & Demark, V. M. (2015). Endothelial disruptive proinflammatory effects of nicotine and e-cigarette vapor exposures. *Am J Physiol Lung Cell Mol Physiol*, 309, 175–187. <https://doi.org/10.1152/ajplung.00411.2014>.-The
- Su, L.-J., Zhang, J.-H., Gomez, H., Murugan, R., Hong, X., Xu, D., Jiang, F., & Peng, Z.-Y. (2019). Reactive Oxygen Species-Induced Lipid Peroxidation in Apoptosis, Autophagy, and Ferroptosis. *Oxidative Medicine and Cellular Longevity*, 2019, 5080843. <https://doi.org/10.1155/2019/5080843>
- Suryana, A. L., & Restuti, A. N. S. (2017). Nitric Oxide Pada Perokok dan Bukan Perokok. *Prosiding Seminar Nasional Hasil Penelitian : Ristekdikti*, 6–10.
- Tang, J., Chen, L. R., & Chen, K. H. (2022). The Utilization of Dehydroepiandrosterone as a Sexual Hormone Precursor in Premenopausal and Postmenopausal Women: An Overview. *Pharmaceuticals*, 15(1). <https://doi.org/10.3390/ph15010046>
- Tawa, M., Kinoshita, T., Masuoka, T., Yamashita, Y., Nakano, K., Nishio, M., Okamura, T., & Ishibashi, T. (2020). Impact of cigarette smoking on nitric oxide-sensitive and nitric oxide-insensitive soluble guanylate cyclase-mediated vascular tone regulation. *Hypertension Research*, 43(3), 178–185. <https://doi.org/10.1038/s41440-019-0363-y>

- Teixeira, B. C., Lopes, A. L., Macedo, R. C. O., Correa, C. S., Ramis, T. R., Ribeiro, J. L., Reischak-Oliveira, A., Teixeira, B. C., Lopes, A. L., Macedo, R. C. O., Correa, C. S., Ramis, T. R., Ribeiro, J. L., & Reischak-Oliveira, A. (2014). Inflammatory markers, endothelial function and cardiovascular risk. *Jornal Vascular Brasileiro*, 13(2), 108–115. <https://doi.org/10.1590/jvb.2014.054>
- Tsikis, D. (2017). Assessment of lipid peroxidation by measuring malondialdehyde (MDA) and relatives in biological samples: Analytical and biological challenges. *Analytical Biochemistry*, 524, 13–30. <https://doi.org/https://doi.org/10.1016/j.ab.2016.10.021>
- Wahid, R. S., Kabo, P., & Djabir, Y. Y. (2019). Efek Pemberian Vitamin A terhadap Perubahan Peroksidasi Lipid Paru pada Tikus yang Terpapar Asap Rokok Akut. In *Celebes Health Journal* (Vol. 1, Issue 2). <http://journal.ildikti9.id/CPHJ/indexDOI:https://doi.org/>
- West, R. (2017). Tobacco smoking: Health impact, prevalence, correlates and interventions. *Psychology and Health*, 32(8), 1018–1036. <https://doi.org/10.1080/08870446.2017.1325890>
- Widmer, R. J., & Lerman, A. (2014). Endothelial dysfunction and cardiovascular disease. *Global Cardiology Science & Practice*, 2014(3), 291–308. <https://doi.org/10.5339/gcsp.2014.43>
- Wu, S., Ruan, Y., Yin, M., & Lai, W. (2007). Research on the age-related changes in the nitric oxide pathway in the arteries of rats and the intervention effect of dehydroepiandrosterone. *Gerontology*, 53(4), 234–237. <https://doi.org/10.1159/000100961>
- Zhu, H.-Y., Hong, F.-F., & Yang, S.-L. (2021). The Roles of Nitric Oxide Synthase/Nitric Oxide Pathway in the Pathology of Vascular Dementia and Related Therapeutic Approaches. *International Journal of Molecular Sciences*, 22(9), 4540. <https://doi.org/10.3390/ijms22094540>

## LAMPIRAN

### Lampiran 1. Rekomendasi Persetujuan Etik



#### REKOMENDASI PERSETUJUAN ETIK

Nomor : 826/UN4.6.4.5.31/ PP36/ 2021

Tanggal: 27 Desember 2021

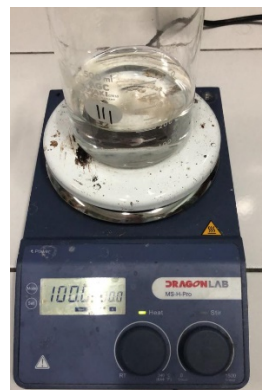
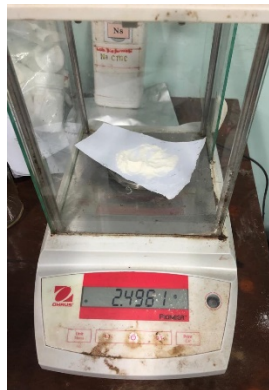
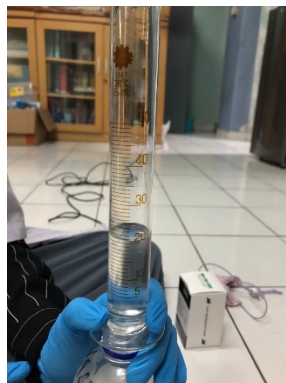
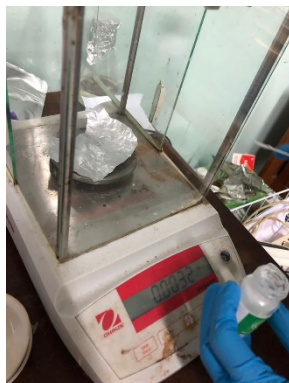
Dengan ini Menyatakan bahwa Protokol dan Dokumen yang Berhubungan Dengan Protokol berikut ini telah mendapatkan Persetujuan Etik :

No Protokol	UH21110723		No Sponsor	
Peneliti Utama	Nila Ridhayani, SPd		Sponsor	
Judul Peneliti	Efek Pemberian Dehydroepiandrosterone (DHEA) Terhadap Aktivitas Peroksidasi Lipid dan Kadar Nitrit Oksida Pada Jaringan Aorta Tikus Wistar Jantan yang Terpapar Asap Rokok			
No Versi Protokol	1	Tanggal Versi	25 Nopember 2021	
No Versi PSP		Tanggal Versi		
Tempat Penelitian	Laboratorium Fakultas Farmasi Universitas Hasanuddin Makassar			
Jenis Review	<input type="checkbox"/> Exempted	<input checked="" type="checkbox"/> Expedited	<input type="checkbox"/> Fullboard Tanggal	Masa Berlaku 27 Desember 2021 sampai 27 Desember 2022 Frekuensi review lanjutan
Ketua KEPK FKUH RSUH dan RSWS	Nama	Prof.Dr.dr. Suryani As'ad, M.Sc.,Sp.GK (K)		Tanda tangan
Sekretaris KEPK FKUH RSUH dan RSWS	Nama	dr. Agussalim Bukhari, M.Med.,Ph.D.,Sp.GK (K)		Tanda tangan

Kewajiban Peneliti Utama:

- Menyerahkan Amandemen Protokol untuk persetujuan sebelum di implementasikan
- Menyerahkan Laporan SAE ke Komisi Etik dalam 24 Jam dan dilengkapi dalam 7 hari dan Laporan SUSAR dalam 72 Jam setelah Peneliti Utama menerima laporan
- Menyerahkan Laporan Kemajuan (progress report) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah
- Menyerahkan laporan akhir setelah Penelitian berakhir
- Melaporkan penyimpangan dari protokol yang disetujui (protocol deviation / violation)
- Mematuhi semua peraturan yang ditentukan



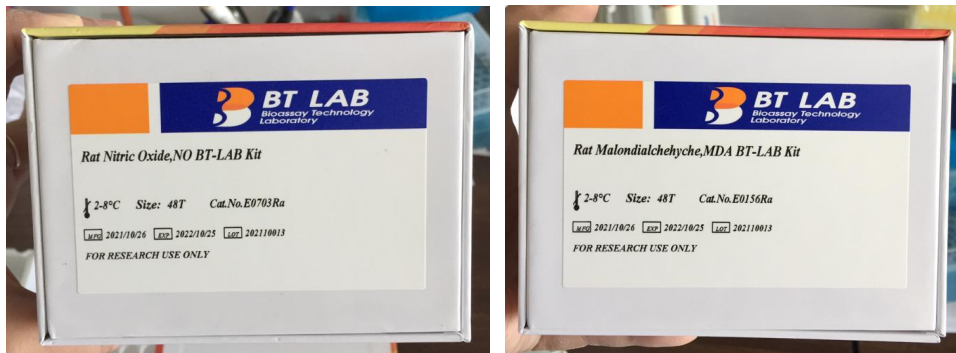
**Lampiran 2. Dokumentasi Penelitian****Gambar 1. Adaptasi Hewan Coba****Gambar 2. Penimbangan BB Tikus****Gambar 3. Pembuatan Larutan CMC 0.5%****Gambar 4. Pembuatan Larutan DHEA****Gambar 5. Pemberian DHEA pada tikus**



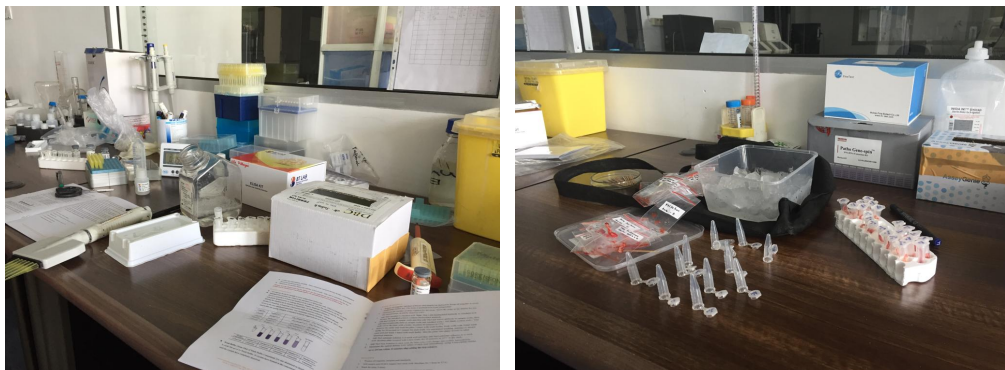
**Gambar 6.** Pemaparan asap rokok pada tikus



**Gambar 7.** Pembedahan hewan coba



**Gambar 8.** Kit ELISA



**Gambar 9.** Persiapan Pemeriksaan ELISA



**Gambar 10.** Penghancuran Jaringan Aorta



**Gambar 11.** Hasil Pemeriksaan ELISA

Lampiran 3. Tabel Data Hasil Pemeriksaan ELISA

<b>DHEA</b>	<b>MDA</b>	<b>NO</b>
Kontrol Negatif 30	1,68	75,64
Kontrol Negatif 30	1,85	67,55
Kontrol Negatif 30	2,21	84,99
Kontrol Negatif 30	1,44	72,94
Kontrol Negatif 30	1,15	97,49
Kontrol Negatif 30	1,34	83,88
Kontrol Negatif 30	1,77	76,04
Kontrol Negatif 30	2,26	83,61
Kontrol Negatif 14	1,92	83,48
Kontrol Negatif 14	1,71	49,07
Kontrol Negatif 14	1,72	105,65
Kontrol Negatif 14	1,51	100,78
Kontrol Negatif 14	1,86	107,4
Kontrol Negatif 14	0,81	84,88
Kontrol Negatif 14	0,71	72,09
Kontrol Negatif 14	1,26	83,59
Kontrol Negatif 14	0,67	84,7
DHEA (15)	1,91	87,18
DHEA (15)	1,38	90,33
DHEA (15)	1,67	119,19
DHEA (15)	1,18	82,83
DHEA (15)	1,68	104,04
DHEA (15)	2,11	60,02
DHEA (15)	2,66	91,73
DHEA (15)	3,3	101,35
DHEA (30)	1,48	68,1
DHEA (30)	1,76	58,94
DHEA (30)	3,17	90,31
DHEA (30)	3,98	106,02
DHEA (30)	1,87	88,26
DHEA (30)	2,21	91,28
DHEA (30)	4,18	121,94
DHEA (30)	1,94	100,91
DHEA (30)	1,79	97,24

## Lampiran 4. Analisis Statistik

### 1. Analisis Berat Badan *Pilot Study*

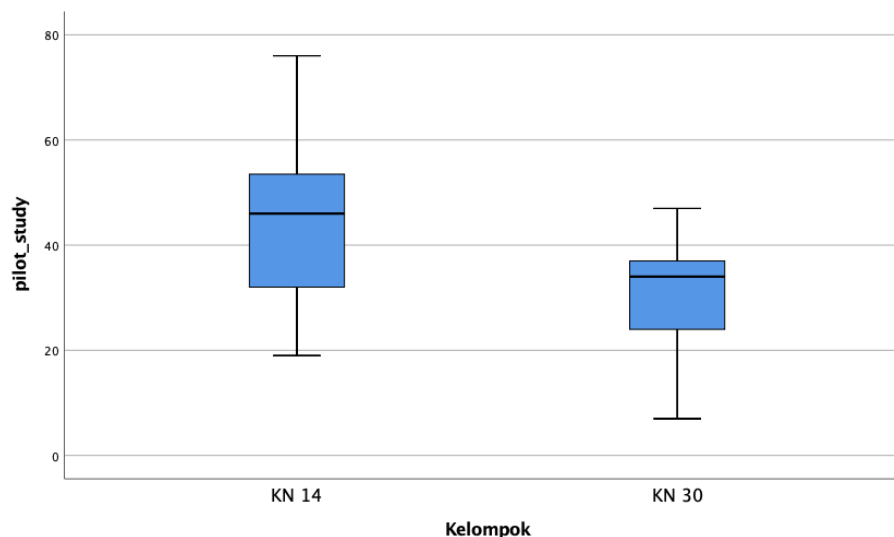
Group Statistics					
	Kelompok	N	Mean	Std. Deviation	Std. Error Mean
pilot_study	KN 14	7	44.57	19.424	7.342
	KN 30	7	30.00	13.140	4.967

Tests of Normality							
	Kelompok	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
pilot_study	KN 14	.185	7	.200*	.973	7	.918
	KN 30	.191	7	.200*	.948	7	.715

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
pilot_study	Equal variances assumed	.749	.404	1.644	12	.126	14.571	8.864	-4.741	33.884
	Equal variances not assumed			1.644	10.541	.130	14.571	8.864	-5.042	34.184



## 2. Analisis Berat Badan Kelompok Perlakuan

### Descriptives

Kelompok Perlakuan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KN 14	7	44.57	19.424	7.342	26.61	62.54	19	76
DHEA 15	6	36.17	28.979	11.831	5.76	66.58	-1	70
DHEA 30	7	7.71	15.892	6.007	-6.98	22.41	-8	41
Total	20	29.15	26.312	5.884	16.84	41.46	-8	76

### Test of Homogeneity of Variances

Kelompok Perlakuan		Levene	df1	df2	Sig.
		Statistic			
Kelompok Perlakuan	Based on Mean	1.948	2	17	.173
	Based on Median	2.019	2	17	.163
	Based on Median and with adjusted df	2.019	2	16.834	.164
	Based on trimmed mean	2.005	2	17	.165

### ANOVA

Kelompok Perlakuan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5176.574	2	2588.287	5.515	.014
Within Groups	7977.976	17	469.293		
Total	13154.550	19			

### Multiple Comparisons

Dependent Variable: Kelompok Perlakuan  
Tukey HSD

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
KN 14	DHEA 15	8.405	12.052	.768	-22.51	39.32
	DHEA 30	36.857*	11.579	.014	7.15	66.56
DHEA 15	KN 14	-8.405	12.052	.768	-39.32	22.51
	DHEA 30	28.452	12.052	.074	-2.47	59.37
DHEA 30	KN 14	-36.857*	11.579	.014	-66.56	-7.15
	DHEA 15	-28.452	12.052	.074	-59.37	2.47

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

### Kelompok Perlakuan

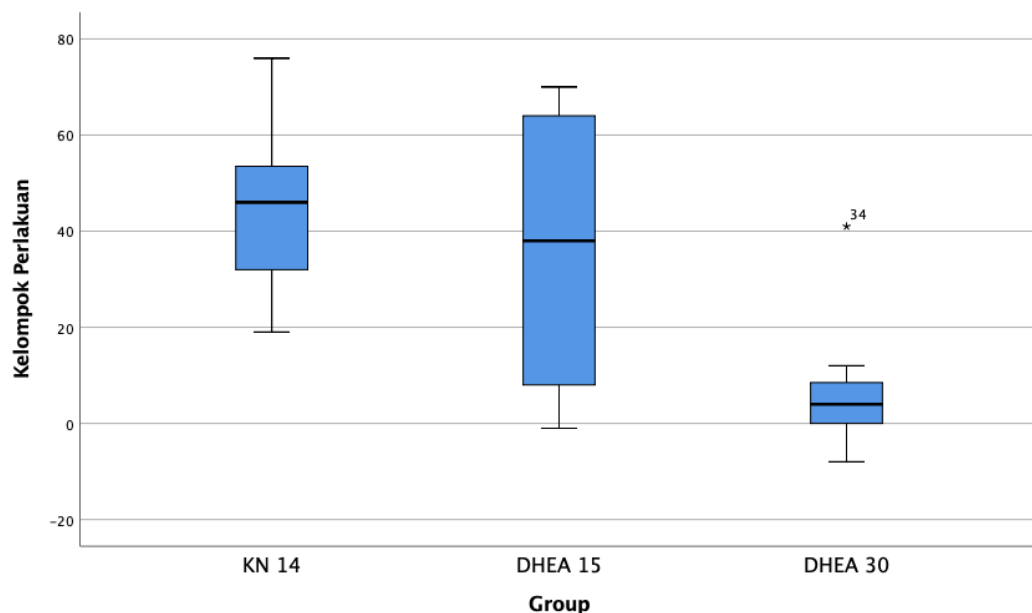
Tukey HSD<sup>a,b</sup>

Group	N	Subset for alpha = 0.05	
		1	2
DHEA 30	7	7.71	
DHEA 15	6	36.17	36.17
KN 14	7		44.57
Sig.		.070	.763

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.632.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.



### 3. UJI NORMALITAS MDA NEGATIF

#### One-Sample Kolmogorov-Smirnov Test

		MDA
N		17
Normal Parameters <sup>a,b</sup>	Mean	1.5240
	Std. Deviation	.48219
	Most Extreme Differences	
	Absolute	.161
	Positive	.107
	Negative	-.161
Test Statistic		.161
Asymp. Sig. (2-tailed)		.200 <sup>c,d</sup>

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

### 4. UJI NORMALITAS MDA DHEA

#### One-Sample Kolmogorov-Smirnov Test

		Residual for MDA
N		26
Normal Parameters <sup>a,b</sup>	Mean	.0000
	Std. Deviation	.74303
	Most Extreme Differences	
	Absolute	.151
	Positive	.151
	Negative	-.102
Test Statistic		.151
Asymp. Sig. (2-tailed)		.130 <sup>c</sup>

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

### 5. UJI NORMALITAS NO NEGATIF

#### One-Sample Kolmogorov-Smirnov Test

		Residual for NO
N		17
Normal Parameters <sup>a,b</sup>	Mean	.0000
	Std. Deviation	14.21303
	Most Extreme Differences	
	Absolute	.137
	Positive	.135
	Negative	-.137
Test Statistic		.137
Asymp. Sig. (2-tailed)		.200 <sup>c,d</sup>



- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. This is a lower bound of the true significance.

#### 6. UJI NORMALITAS NO DHEA

##### One-Sample Kolmogorov-Smirnov Test

		Residual for NO
N		26
Normal Parameters <sup>a,b</sup>	Mean	.0000
	Std. Deviation	17.45512
	Most Extreme Differences	
	Absolute	.159
	Positive	.119
	Negative	-.159
Test Statistic		.159
Asymp. Sig. (2-tailed)		.091 <sup>c</sup>

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.

#### 7. UJI HOMOGENITAS MDA NEGATIF

##### Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
MDA	Equal variances assumed	1.472	.244
	Equal variances not assumed		

#### 8. UJI HOMOGENITAS MDA DHEA

##### Levene's Test of Equality of Error Variances<sup>a</sup>

Dependent Variable: MDA

F	df1	df2	Sig.
3.190	2	23	.060

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

- a. Design: Intercept + DHEA

### 9. UJI HOMOGENITAS NO NEGATIF

#### Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
NO	Equal variances assumed	1.312	.270
	Equal variances not assumed		

### 10. UJI HOMOGENITAS NO DHEA

#### Levene's Test of Equality of Error Variances<sup>a</sup>

Dependent Variable: NO

F	df1	df2	Sig.
.026	2	23	.974

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

a. Design: Intercept + DHEA

### 11. UJI INDEPENDENT T MDA NEGATIF

#### Independent Samples Test

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
MDA	Equal variances assumed	1.654	15	.119	.36807	.22255	-.10627	.84241
	Equal variances not assumed	1.679	14.800	.114	.36807	.21924	-.09977	.83591

## 12. UJI INDEPENDENT T NO NEGATIF

### Independent Samples Test

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
NO	Equal variances assumed	-.766	15	.455	-5.46564	7.13279	20.66882	9.73754
	Equal variances not assumed	-.795	12.165	.442	-5.46564	6.87483	20.42206	9.49077

## 13. ANOVA MDA DHEA

### Tests of Between-Subjects Effects

Dependent Variable: MDA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	5.821 <sup>a</sup>	2	2.910	4.850	.017
Intercept	97.583	1	97.583	162.611	.000
DHEA	5.821	2	2.910	4.850	.017
Error	13.802	23	.600		
Total	117.336	26			
Corrected Total	19.623	25			

a. R Squared = ,297 (Adjusted R Squared = ,235)

## 14. ANOVA NO DHEA

### Tests of Between-Subjects Effects

Dependent Variable: NO

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	214.121 <sup>a</sup>	2	107.061	.323	.727
Intercept	208811.059	1	208811.059	630.515	.000
DHEA	214.121	2	107.061	.323	.727
Error	7617.030	23	331.175		
Total	216868.636	26			
Corrected Total	7831.151	25			

a. R Squared = ,027 (Adjusted R Squared = -,057)

### 15. UJI LANJUT TUKEY MDA DHEA

#### Multiple Comparisons

Dependent Variable: MDA

Tukey HSD

(I) DHEA	(J) DHEA	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Kontrol Negatif 14	DHEA 1 (15)	-.6336	.37642	.233	-1.5763	.3090
	DHEA 2 (30)	-1.1350*	.36518	.013	-2.0495	-.2204
DHEA 1 (15)	Kontrol Negatif 14	.6336	.37642	.233	-.3090	1.5763
	DHEA 2 (30)	-.5013	.37642	.393	-1.4440	.4414
DHEA 2 (30)	Kontrol Negatif 14	1.1350*	.36518	.013	.2204	2.0495
	DHEA 1 (15)	.5013	.37642	.393	-.4414	1.4440

Based on observed means.

The error term is Mean Square(Error) = ,600.

\*. The mean difference is significant at the ,05 level.

#### MDA

Tukey HSD<sup>a,b,c</sup>

DHEA	N	Subset	
		1	2
Kontrol Negatif 14	9	1.3508	
DHEA 1 (15)	8	1.9844	1.9844
DHEA 2 (30)	9		2.4857
Sig.		.227	.386

Means for groups in homogeneous subsets are displayed.

Based on observed means.

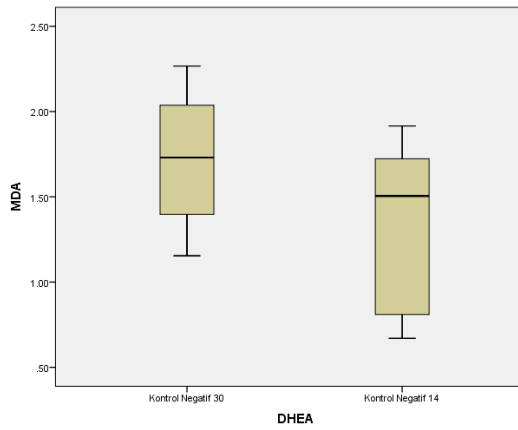
The error term is Mean Square(Error) = ,600.

a. Uses Harmonic Mean Sample Size = 8,640.

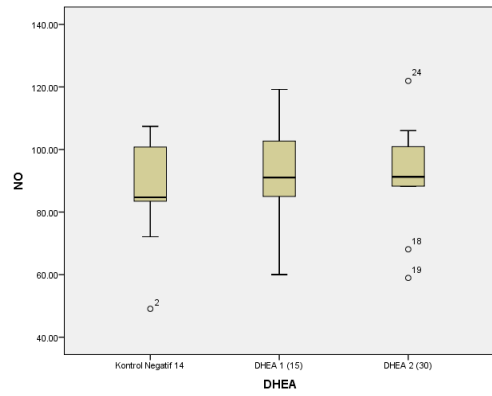
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

c. Alpha = ,05.

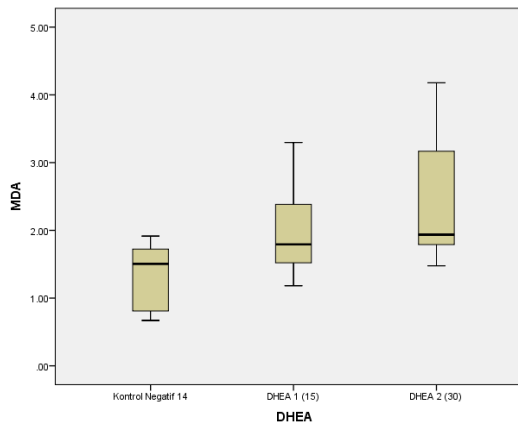
**16. BOXPLOT MDA NEGATIF**



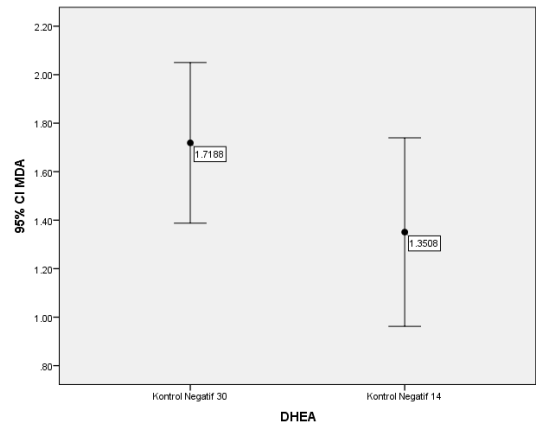
**19. BOXPLOT NO DHEA**



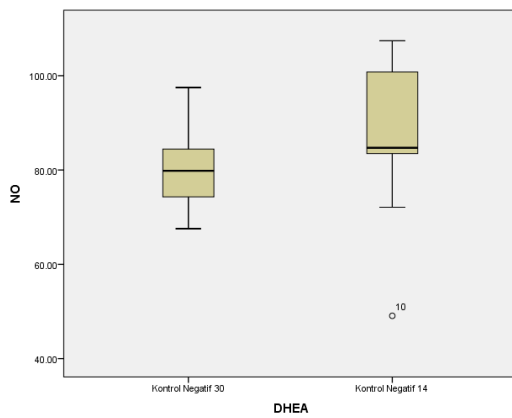
**17. BOXPLOT MDA DHEA**



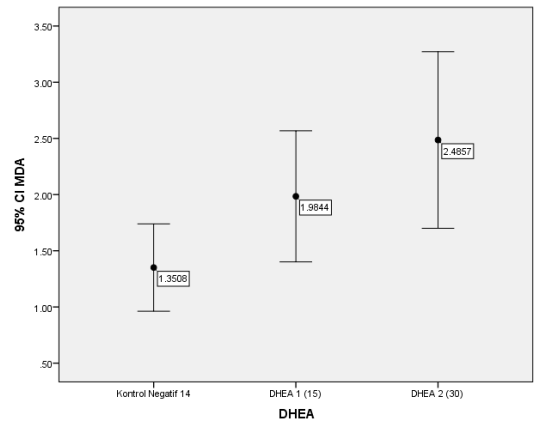
**20. PLOT MEANS MDA NEGATIF**



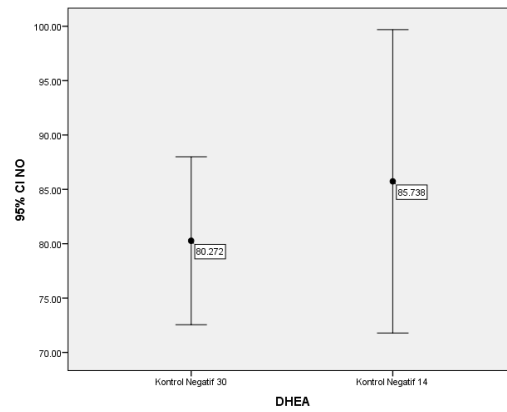
**18. BOXPLOT NO NEGATIF**



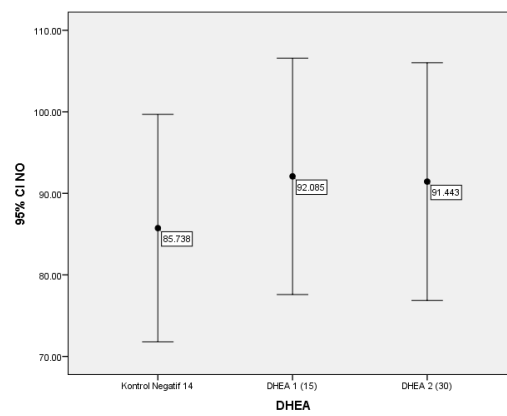
**21. PLOT MEANS MDA DHEA**



## 22. PLOT MEANS NO NEGATIF



## 23. PLOT MEANS NO DHEA



## RIWAYAT HIDUP

Nila Ridhayani, S. Pd., lahir di Barru pada tanggal 1 Desember 1994. Anak pertama dari 3 bersaudara dari pasangan Burhan Abu dan Hasbiah. Penulis mulai memasuki pendidikan formal dan terdaftar sebagai siswa SD Inpres Lalabata, Kab. Barru pada tahun 2000. Pada tahun 2006, penulis melanjutkan pendidikan di SMPN 3 Tanete Rilau, Kab. Barru dan selesai pada tahun 2009. Pada tahun yang sama penulis melanjutkan pendidikan di SMAN 2 Pangkajene, Kab. Pangkep dan lulus pada tahun 2012. Penulis kemudian melanjutkan pendidikan di tahun 2012 dan tercatat sebagai mahasiswa pada jurusan Pendidikan Biologi Bilingual, FMIPA UNM dan lulus di tahun 2019. Pada tahun yang sama, penulis melanjutkan pendidikan dan tercatat sebagai mahasiswa pada Program Magister Ilmu Biomedik, Konsentrasi Fisiologi, Sekolah Pascasarjana Universitas Hasanuddin.

