DAFTAR PUSTAKA

1. Nagwa AI, Sawsan HO, Anil D, Azza MOAR, Nehal AH, Olfat S. Glutathione peroxidase, superoxide dismutase and catalase activities in children with chronic hepatitis. Medical Biochemistry Department, Faculty of Medicine, Cairo University, Cairo, Egypt. 2012. (3). p. 972-7.
2. Murray RK, Granner DK, Mayes PA, Rodwell VW. Biokimia Harper.Edisi 26. Jakarta. EGC. Oksidasi asam lemak: ketogenesis. 2003. p.230-41.
3. Silvia FS. Aktivitas Spesifik Katalase Jaringan Jantung Tikus yang Diinduksi Hipoksia Hipobarik Akut Berulang. FK UI, Jakarta.2009;25-7
4. Ketaren S. Pengantar teknologi dan lemak pangan. Jakarta : Penerbit UI-Press, 2005. 174:69 – 113.
5. Andik ES. Pengaruh Pemberian Minyak Goreng Kelapa Sawit Curah Setelah Pemanasan Berulang pada Struktur Histologis Hati Mencit (skripsi).Surakarta. Fakultas Kedokteran Universitas Sebelas Maret. 2001.
6. Kumala M. Peran asam lemak tak jenuh jamak dalam respon imun. Majalah GizMindo. 2003 : 2(6) : 11-2.
7. Kuncahyo I, Sunardi. Uji aktivitas antioksidan ekstrak belimbing wuluh (Averrhoa bilimbi L.) terhadap 1,1-diphenyl-2-picrylhidrazyl (DPPH). Seminar Nasional Teknologi. 2007. p.1-9.
8. Dusica P, Vesna T. Oxidative stres as marker of positive symptoms in schizophrenia. Facta Universitatis. Medicine & Biology,2002.9(2):157-61.
9. Sarwono B. Ubi Jalar Cara Budi Daya yang Tepat Efisien dan Ekonomis Seni Agribisnis. Jakarta Penerbit Siuaelaya. 2005.
10. Hattunisa RH. Etikaningrum P. Kajian Alternatif Produk Pangan yang Dapat Dikembangkan dari Buah Naga. Institut Pertanian Bogor. 2009.
11. Risma SH, Okkytania EP. Kajian Alternatif Produk Pangan yang Dapat Dikembangkan dari Buah Naga. Institut Pertanian Bogor. 2009.
12. D Wu, J Lu, Y Zheng, Z Zhou, Q Shan, and D F Ma. Purple Sweet Potato Color Repairs D-Galactose-Induced Spatial Learning And Memory

Impairment By Regulating The Expression Of Synaptic Proteins. Neurobiology of Learning and Memory. 2008.90(1), p. 19–27.

13. Velayutham M, Raman S V, Winner M W 3rd, Tran T, Simonetti O P, Baker P B et al. 2008. In Vivo Atherosclerotic Plaque Characterization Using Magnetic Susceptibility Distinguishes Symptom-Producing Plaques. JACC Cardiovasc Imaging. 2008.1(1) : 49-57.
14. Halliwell B, Gutteridge J M C. Free Radicals In Biology And Medicine.Fourth edition. New York. Oxford University Press. 2007.
15. Azeredo H M C, Faria J A F, Silva. Inimization Of Proxide Formation Rate In Soybean Oil By Antioxidant Combinations. Food Research International. 2004. 37:689-94.
16. X Hou, Y Qi, X Qiao, G Wang, Z Qin, J Wang. Lewis Acid-Catalyzed Transesterification And Esterification Of High Free Fatty Acid Oil In Subcritical Methanol. Kor J Chem Eng 2007:24(2).
17. Ghidurus M, Turtoi M, Boskou G, Niculita P, Stan V. Nutritional And Health Aspects Related To Frying.Romanian Biotechnological Letters. 2010.(15).p.6.
18. Sartika R A D. Pengaruh Suhu Dan Lama Proses Menggoreng (Deep Frying) Terhadap Pembentukan Asam Lemak Trans. Markara Sains 2009.13: 23-8.
19. Malhi H, Gores G J. Molecular Mechanism Of Lipotoxicity In Nonalcoholic Fatty Liver Disease. Semin Liver Dis., 2008.28(4):360-9.
20. Koch A, KÖnig B, Spielmann J, Leitner A, Stang GL, Eder K. Thermally Oxidized Oil Increases The Expression Of Insulin-Induced Genes And Inhibits Activation Of Sterol Regulatory Element-Binding Protein-2 In Rat Liver. Journal of Nutrition: Biochemical, Molecular, and Genetic Mechanisms.2007. 137: 2018–23.
21. Jusup SA, Raharjo SS. Efek Ekstrak Daun Krokot (Portulaca oleracea L.) Sebagai Anti Oksidan Alami Terhadap Kadar Alanin Transaminase (ALT) dan Gambaran Histologi Sel Hepar Rattus norvegicus L. yang Diberi Minyak Goreng deep frying. Surakarta. Universitas Sebelas Maret. 2010.

22. Pham-Huy L A P, He H, Pham-Huy, C. Free Radicals, Antioxidants in Disease and Health. Int J Biomed Sci. 2008. 4:89-96.
23. Yuniastuti A. 2008. Gizi dan Kesehatan. Graha Ilmu, Yogyakarta.
24. Brooker, Robert J. Genetics: analysis and principles (4th ed.). McGraw-Hill Science.2011.
25. Bag A, Bag N. Target sequence polymorphism of human manganese superoxide dismutase gene and its association with cancer risk: a review. Cancer Epidemiol Biomarker Prev, 2008.17(12):3298-305.
26. Harju T, Wiik RK, Sirvio R, Paakko P, Crapo JD, Oury TD, et al. Manganese superoxide lungs. Eur Respir J, 2004. 24:765-71.
27. Favier, A. Oxidative stres in human diseases. Annales Pharmaceutiques Françaises. 2006. 64, 390-6.
28. Winarsi Hery. Antioksidan Alami dan Radikal Bebas. Kanisius, Yogyakarta, 2011.
29. Masagus Z, Inawati W. Aktivitas Spesifik Manganese Superoxide Dismutase (MnSOD) dan Katalase Pada Hati Tikus yang Diinduksi Hipoksia Sistemik:Hubungannya Dengan Kerusakan Oksidatif. Departemen Biokimia dan Biologimolekuler FKUI.2012.(2),p.87-92.
30. Oberley. Cell signaling enzyme .[cited 2013 November 15].Available from:http://www.sigmaaldrich.com/life-science/metabolomics/enzyme explorer/cell- signaling-enzymes/superoxide-dismutase.html
31. Ratnayati. Pengembangan Makanan Fungsional Mengandung Antioksidan Berbahan Baku Ubi ungu yang Aman Dikonsumsi Bagi Penderita Diabetes Melitus. Yogyakarta: Lembaga Ilmu Pengetahuan: 2011.
32. Eric G, Rolf D, Michael WD, Ronald JS. β-Carotene Prevents Bile Acid-Induced Cytotoxicity in the Rat Hepatocyte: Evidence for an Antioxidant and Anti-Apoptotic Role of β-Carotene In Vitro Pediatric Liver Center and Liver Transplantation Program, Section of Pediatric Gastroenterology, Hepatology and Nutrition, Department of Pediatrics, University of Colorado School of Medicine and The Children's Hospital, Denver, Colorado 80262, U.S.A. Pediatric Research, 2004. (55), 814–21

33. Lin MT, Beal MF. Mitochondrial dysfunction and oxidative stres in neurodegenerative diseases. Nature. 2006. 443 (7113): 787-95.
34. Alzheimer's Association. Alzheimer's disease facts and figures. Alzheimers Dement. 2010 ; 6 (2): 158-9.
35. Serrano PA, Frosch MP, Masliah E, Hyman BT. Neuropathological alterations in Alzheimer disease. Cold Spring Harb Perspect Biol. 2011;3(9):6189.
36. Banati Rahmawati, Eedwi Mahajoeno. Variation of morphology, isozymic and vitamin C content of dragon fruit varieties. Nusantara bioscience. 2009. 1(3),p. 131-7.
37. Rein, Maarit. Copigmentation Reaction and Color Stability of Berry Anthocyanins. Academic Dessertation. Department of Applied Chemistryand Microbiology Food Chemistry Division. University of Helsinki. Finlandia. 2005.
38. Luca V, Patrizia R, Alessandra M, Marisa P, Silvia F, Carlo A. Dietary Anthocyanins as Nutritional Therapy for Nonalcoholic Fatty Liver Disease. Italy. 2013. p. 1-8.
39. Q Shan, J Lu, Y Zheng, J Li, Z Zhou, B Hu et al. Purple Sweet Potato Color Ameliorates Cognition Deficits and Attenuates Oxidative Damage and Inflamation in Aging Mouse Brain Induced by D-Galactose. Key Laboratory for Biotechnology on Medicinal Plants of Province, School of Life Science, Xuzhou Normal University, Xuzhou 221116, China. 2009. p.1-9.
40. Astawan, M. Panduan Karbohidrat Terlengkap. Jakarta: Dian Rakyat. 2009.
41. Dwi-Prmayanti I D A I, Aman I G M, Agus-Bagiada N. Ipomoea batatas Syrup Decrease Malondialdehyde and Increase Nitrous Oxide Plasma Levels Amongst Moderate Smoker Workers at Denpasar. Medical faculty Udayana University. Bali Medical Journal. 2012. 1(3):125-30.

42. T Iwase, A Tajima, S Sugimoto, K Okuda, I Hironaka, Y Kamata et al. A Simple Assay for Measuring Catalase Activity: A Visual Apprach. The Jikei University School of Medicine. 2013. 3:3081.
43. Dalle D, Rossi R, Colombo R, Giustarini D, Milzani A. Biomarkers Of Oxidative Damage in human disease. Clinical chemistry [internet].2006 Apr [cited 2012 Dec 28]; 52(4):601-23. Available from: http://www.ncbi.nlm.nih.gov/pubmed/16484333
44. Trijono S. Pemberian Ekstrak Kelopak Bunga Rosela Menurunkan Malondialdehid Pada Tikus Yang Diberi Minyak Jelantah (Skripsi). Denpasar: Universitas Udayana. 2012.
45. Yeny S. Pengaruh pemberian Likopen Terhadap Status Antioksidan (Vitamin C, Vitamin E dan Gluthathion Peroksidase) Tikus (Rattus norvegicus galur Sprague Dawley) Hiperkolesterolemik. Universitas Diponegoro. 2006.
46. Yuniastuti A, Purwaningsih E. Pengaruh pemberian susu fermentasi Lactobacillus casei galur shirota terhadapkadar fraksi lipid serum dan jumlah coliform serta lactobacilli pada feses tikus hiperkolesterolemi. M Med Indones, 2004. 39(4)
47. Bendia E, Benedetti A, Baroni G S, Candelaresi C, Macarri G, Trozzi, L et al. Effect of cyanidin 3-O-beta-glucopyranoside on hepatic stellate cell proliferation and collagen synthesis induced by oxidative stress. Dig Liver Dis. 2005.37, 342
48. Lyu SY, Park WB. Photoprotective Potential of Anthocyanins Isolated from Acanthopanax divaricatus Var. albeofructus Fruits against UV Irradiation in Human Dermal Fibroblast Cells. Photochem Photobiol, 2012. 20(2): 201–6.
49. Spormann TM, Albert FW, Rath T, Dietrich H, Will F, Stockis J P et al. Anthocyanin/polyphenolic-rich fruit juice reduces oxidative cell damage in an intervention study with patients on hemodialysis. Cancer Epidemiol Biomarkers Prev, 2008.17(12),3372.

50. Shih PH, Chan YC, Liao JW, Wang MF, Yen GC. Antioxidant and cognitive promotion effects of anthocyanin-rich mulberry (Morus atropurpurea L.) on senescence-accelerated mice and prevention of Alzheimer's disease. J Nutr Biochem. 2010. 21, 598.
51. Manach C, Williamson G, Morand C, Scalbert A, Remesy C. Bioavailability and bioefficacy of polyphenols in humans. I. Review of 97 bioavailability studies. Am J Clin Nutr. 2005. 81, 230.
52. Kay CD, Mazza GJ, Holub BJ. Showing pharmacokinetics for Peonidin 3-O-galactoside metabolite after consumption of Chokeberry, extract in humans J Nutr. 2005. 135:2582.
53. Simona L. Antosianins Mechanism of action and therapeutic efficacy. 2012. p. 27-57
54. Dendougui F, Schwedt G. Effect of dephytinization on bioavailability of iron, calcium and zinc from infant cereals assessed in the Caco-2 cell model. Eur Food Res Tech. 2004. 219, 409
55. Matsumoto H, Ito K, Yonekura K, Tsuda T, Ichiyanagi T, Hirayama M et al. Enhanced absorption of anthocyanins after oral administration of phytic acid in rats and humans. J Agric Food Chem. 2007. 55(6), 2489.
56. Sadilova E, Carle R, Stintzing FC. Thermal degradation of antosianins and its impact on color and in vitro antioxidant capacity. Mol. Nutr. Food Res. 2007. (51),1461–71.
57. Dai J, Gupte A, Gates L, Mumper RJ. A comprehensive study of antosianin-containing extracts from selected blackberry cultivars: Extraction methods, stability, anticancer properties and mechanisms. 2009. (10),1016
58. Padda MS. Phenolic Composition And Antioxidant Activity Of Sweetpotatoes (Ipomoea Batatas (L)).Punjab Agricultural University.2006
59. Vertuani S, Augusti A, Maufredina S. The antioxidants and prooxidants network: An overview. Curr. Pharm. 2004. 10(14): 1677- 94.

60. Ahn J, Gru ¨n IU, Mustapha A. Effects of plant extracts on microbial growth, color change, and lipid oxidation in cooked beef. Food Micro. 2007.24:7–14.
61. Yetella RR, Min DB. Quenching mechanisms and kinetics of trolox and ascorbic acid on the riboflavin-photosensitized oxidation of tryptophan and tyrosine. J Agric Food Chem. 2008.56(22):10887–92
62. A Ologundudu, IA Ololade, FO Obi. Effect of Hibiscus sabdariffa anthocyanin on 2,4-dinitrophenylhidrazine-induced hematotoxicity in rabbits. African journal of biochemistry. 2009. 3(4), p. 140-4
63. Halliwell B, Gutteridge JMC. Antioxidant Defences Endogenous and Diet Derived. In Free radicals in biology and medicine. 4th ed. London: Oxford. University Press, 2007.p. 79-186.

LAMPIRAN

Identitas

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Riwayat Pendidikan Formal

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4.	FK UNDIP	: Masuk Tahun 2010	

Keanggotaan Organisasi

1.	KSM	Tahun 2010 s/d 2012
2	KMHD	Tahun 2012 s/d 2013

Pengalaman penelitian

1. Efek Yoghurt Kacang Merah (*Phaseolus vulgaris*) Terhadap Profil Lipid Serum dan Jumlah *Colifrm* Serta *Lactobacilli* feses pada Tikus Dislipidemia. Tahun 2012.
2. Yoghurt Kacang Tanah (*Arachis hypogea*) Sebagai Inovasi Pangan Sehat Anti-Osteoporosis: Studi Eksperimental Pada Tikus Wistar Model Osteoporosis. Tahun 2014.

Pengalaman presentasi karya ilmiah

Made Helthayana Trisnawan, Potensi Nitrat Oksida Sebagai Terapi Baru Yang Potensial dalam Penanganan Osteoporosis Pada Perempuan Postmenopause, TEMILNAS, Tahun 2012.Cara presentasi poster

Pengalaman mengikuti lomba karya ilmiah

1. Hamdan Yuwafi Naim, Raras Rachmandiar, Gerin Orviyanti, Ihsan Fadilah, Made Helthayana Trisnawan. Efek Yoghurt Kacang Merah (*Phaseolus vulgaris*) Terhadap Profil Lipid Serum dan Jumlah *Colifrm* Serta *Lactobacilli* feses pada Tikus Dislipidemia, Penyelenggara: Universitas Udayana, prestasi (juara ke-3)
2. Made Helthayana Trisnawan, Ihsan Fadilah Potensi Nitrat Oksida Sebagai Terapi Baru Yang Potensial dalam Penanganan Osteoporosis Pada Perempuan Postmenopause, Penyelenggara : FK UMY, Prestasi (Finalis 10 besar)
3. Ihsan Fadilah, Made Helthayana Trisnawan, Farah Firdausi, I Made Prasetya Wardana, Nadya Azzahra. Yoghurt Kacang Tanah (*Arachis hypogea*) Sebagai Inovasi Pangan Sehat Anti-Osteoporosis: Studi Eksperimental Pada Tikus Wistar Model Osteoporosis, Penyelenggara : DIKTI, Prestasi (didanai oleh DIKTI)

KOMISI ETIK PENELITIAN KESEHATAN (KEPK)
FAKULTAS KEDOKTERAN UNIVERSITAS DIPONEGORO
DAN RSUP dr KARIADI SEMARANG
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ETHICAL CLEARANCE
No.318 /EC/FK-RSDK/2014

Komisi Etik Penelitian Kesehatan Fakultas Kedokteran Universitas Diponegoro- RSUP. Dr. Kariadi Semarang, setelah membaca dan menelaah USULAN Penelitian dengan judul :

PENGARUH PEMBERIAN UBI UNGU (*IPOMOEA BATATAS L*) TERHADAP KADAR ENZIM KATALASE HEPAR DAN OTAK PADA TIKUS YANG DIBERIKAN MINYAK JELANTAH

Peneliti Utama	:	Made Helthayana Trisnawan
Pembimbing	:	dr. Inawati Jusup, Sp.KJ
Penelitian	:	Dilaksanakan Laboratorium Parasitologi FK Undip Semarang

Setuju untuk dilaksanakan, dengan memperhatikan prinsip-prinsip yang dinyatakan dalam Deklarasi Helsinki 1975, yang diamended di Seoul 2008 dan Pedoman Nasional Etik Penelitian Kesehatan (PNEPK) Departemen Kesehatan RI 2011

Pada laporan akhir peneliti harus melampirkan cara pemeliharaan & dekapitasi hewan coba dan melaporkan ke KEPK bahwa penelitian sudah selesai di lampiri Abstrak Penelitian.

Semarang, 30 JUN 2014

Komisi Etik Penelitian Kesehatan
Fakultas Kedokteran Undip-RSUP Dr. Kariadi
Ketua,

Prof.Dr.dr.Suprihati, M.Sc, Sp.THT-KL(K)
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KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS DIPONEGORO
FAKULTAS KEDOKTERAN
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Lamp :
Perihal : Ijin Penelitian

Ytli.
Pembantu Dekan I
FK UNDIP
Di Semarang

Sehubungan surat dari Pembantu Dekan I nomor 2025/UN7.3.4/D1/PP/2014 tanggal 14 Mei 2014 tentang Permohonan Ijin Penelitian :

Nama : 1. Made Helihayana Trisnawan / 22010110120138

Judul : Pengaruh Pemberian Ubi Ungu (Ipomoea Batatas. L) terhadap Kadar Enzim Katalase Hepar dan Otak pada Tikus yang Diberikan Minyak Jelantah.

Pembimbing : dr. Innawati Jusup, M.Kes, Sp.KJ

Kami selaku kepala Laboratorium Parasitologi FK UNDIP memberikan Ijin untuk melakukan penelitian tersebut diatas di laboratorium parasitologi FK UNDIP.

Atas perhatian dan kerjasamanya diucapkan terima kasih.

Semarang, 19 Mei 2014
Ketua

dr. Sudaryanto, MPd.Ked
NIP 197000416199702100l

Tembusan :
1. Ketua Tim Karya Tulis Ilmiah
2. Pembimbing

Data Deskriptif

Descriptives

	Kelompok			Statistic	Std. Error
Kadar_enzim_katalase_otak	kontrol negatif (K1)	Mean		.1500	.04082
		95% Confidence Interval for Mean	Lower Bound	.0451	
			Upper Bound	.2549	
		5% Trimmed Mean		.1500	
		Median		.1500	
		Variance		.010	
		Std. Deviation		.10000	
		Minimum		.00	
		Maximum		.30	
		Range		.30	
		Interquartile Range		.15	
		Skewness		.000	.845
		Kurtosis		.925	1.741
	Kontrol positif jelantah (K2)	Mean		.1667	.07601
		95% Confidence Interval for Mean	Lower Bound	-.0287	
			Upper Bound	.3621	
		5% Trimmed Mean		.1574	
		Median		.1500	
		Variance		.035	
		Std. Deviation		.18619	
		Minimum		.00	
		Maximum		.50	
		Range		.50	
		Interquartile Range		.28	
		Skewness		1.281	.845
		Kurtosis		1.853	1.741
	Kontrol positif ubi	Mean		.1000	.04472

	ungu (K3)		Lower Bound	-.0150	
		95% Confidence Interval for Mean	Upper Bound	.2150	
		5% Trimmed Mean		.0944	
		Median		.1000	
		Variance		.012	
		Std. Deviation		.10954	
		Minimum		.00	
		Maximum		.30	
		Range		.30	
		Interquartile Range		.15	
		Skewness		1.369	.845
		Kurtosis		2.500	1.741
	Perlakuan (K4)	Mean		.0650	.02500
		95% Confidence Interval for Mean	Lower Bound	.0007	
			Upper Bound	.1293	
		5% Trimmed Mean		.0639	
		Median		.0700	
		Variance		.004	
		Std. Deviation		.06124	
		Minimum		.00	
		Maximum		.15	
		Range		.15	
		Interquartile Range		.11	
		Skewness		.176	.845
		Kurtosis		-1.706	1.741
Kadar_enzim_katalase_hepar	kontrol negatif (K1)	Mean		4.5200	1.27159
		95% Confidence Interval for Mean	Lower Bound	1.2513	
			Upper Bound	7.7887	
		5% Trimmed Mean		4.4944	
		Median		3.7600	

		Variance		9.702	
		Std. Deviation		3.11474	
		Minimum		1.00	
		Maximum		8.50	
		Range		7.50	
		Interquartile Range		6.30	
		Skewness		.436	.845
		Kurtosis		-1.857	1.741
		Mean		5.8000	1.19443
		95% Confidence Interval for Mean	Lower Bound	2.7296	
			Upper Bound	8.8704	
		5% Trimmed Mean		5.8889	
		Median		6.4000	
	Kontrol positif jelantah (K2)	Variance		8.560	
		Std. Deviation		2.92575	
		Minimum		1.00	
		Maximum		9.00	
		Range		8.00	
		Interquartile Range		5.00	
		Skewness		-.854	.845
		Kurtosis		.167	1.741
	Kontrol positif ubi ungu (K3)	Mean		5.8333	.94575
		95% Confidence Interval for Mean	Lower Bound	3.4022	
			Upper Bound	8.2645	
		5% Trimmed Mean		5.8148	
		Median		5.5000	
		Variance		5.367	
		Std. Deviation		2.31661	
		Minimum		3.00	
		Maximum		9.00	
		Range		6.00	
		Interquartile Range		4.50	

		Skewness		.300	.845
		Kurtosis		-1.418	1.741
		Mean		5.0400	.72507
		95% Confidence Interval for Mean	Lower Bound	3.1761	
			Upper Bound	6.9039	
		5% Trimmed Mean		4.9611	
		Median		4.6700	
	Perlakuan (K4)	Variance		3.154	
		Std. Deviation		1.77606	
		Minimum		3.20	
		Maximum		8.30	
		Range		5.10	
		Interquartile Range		2.33	
		Skewness		1.442	.845
		Kurtosis		2.607	1.741

Uji levene katalase

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Kadar_enzim_katalase_hepar	.942	3	20	.439
Kadar_enzim_katalase_otak	1.270	3	20	.312

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Kadar_enzim_katalase_hepar	Between Groups	7.263	3	2.421	.362	.781
	Within Groups	133.913	20	6.696		
	Total	141.176	23			
Kadar_enzim_katalase_otak	Between Groups	.039	3	.013	.861	.477
	Within Groups	.302	20	.015		
	Total	.341	23			

Multiple Comparisons

LSD

Dependent Variable	(I) Kelompok	(J) Kelompok	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Kadar_enzim_katalase_hepar	kontrol negatif (K1)	Kontrol positif jelantah (K2)	-1.28000	1.49395	.402	-4.3963	1.8363
		Kontrol positif ubi ungu (K3)	-1.31333	1.49395	.390	-4.4297	1.8030
		Perlakuan (K4)	-.52000	1.49395	.731	-3.6363	2.5963
	Kontrol positif jelantah (K2)	kontrol negatif (K1)	1.28000	1.49395	.402	-1.8363	4.3963
		Kontrol positif ubi ungu (K3)	-.03333	1.49395	.982	-3.1497	3.0830
		Perlakuan (K4)	.76000	1.49395	.617	-2.3563	3.8763

		kontrol negatif (K1)	1.31333	1.49395	.390	-1.8030	4.4297
	Kontrol positif ubi ungu (K3)	Kontrol positif jelantah (K2)	.03333	1.49395	.982	-3.0830	3.1497
		Perlakuan (K4)	.79333	1.49395	.601	-2.3230	3.9097
		kontrol negatif (K1)	.52000	1.49395	.731	-2.5963	3.6363
	Perlakuan (K4)	Kontrol positif jelantah (K2)	-.76000	1.49395	.617	-3.8763	2.3563
		Kontrol positif ubi ungu (K3)	-.79333	1.49395	.601	-3.9097	2.3230
Kadar_enzim_katalase_otak		Kontrol positif jelantah (K2)	-.01667	.07096	.817	-.1647	.1313
	kontrol negatif (K1)	Kontrol positif ubi ungu (K3)	.05000	.07096	.489	-.0980	.1980
		Perlakuan (K4)	.08500	.07096	.245	-.0630	.2330
		kontrol negatif (K1)	.01667	.07096	.817	-.1313	.1647
	Kontrol positif jelantah (K2)	Kontrol positif ubi ungu (K3)	.06667	.07096	.359	-.0813	.2147
		Perlakuan (K4)	.10167	.07096	.167	-.0463	.2497
	Kontrol positif ubi ungu (K3)	kontrol negatif (K1)	-.05000	.07096	.489	-.1980	.0980
		Kontrol positif jelantah (K2)	-.06667	.07096	.359	-.2147	.0813

		Perlakuan (K4)	.03500	.07096	.627	-.1130	.1830
		kontrol negatif (K1)	-.08500	.07096	.245	-.2330	.0630
	Perlakuan (K4)	Kontrol positif jelantah (K2)	-.10167	.07096	.167	-.2497	.0463
		Kontrol positif ubi ungu (K3)	-.03500	.07096	.627	-.1830	.1130

Uji Normalitas

Tests of Normality

	Kelompok	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Kadar_enzim_katalase_otak	kontrol negatif (K1)	.167	6	.200*	.976	6	.933
	Kontrol positif jelantah (K2)	.262	6	.200*	.862	6	.195
	Kontrol positif ubi ungu (K3)	.333	6	.036	.814	6	.078
	Perlakuan (K4)	.216	6	.200*	.899	6	.366
Kadar_enzim_katalase_hepar	kontrol negatif (K1)	.201	6	.200*	.901	6	.382
	Kontrol positif jelantah (K2)	.167	6	.200*	.949	6	.731
	Kontrol positif ubi ungu (K3)	.159	6	.200*	.958	6	.801
	Perlakuan (K4)	.253	6	.200*	.886	6	.296

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

a. Lilliefors Significance Correction

Katalase hepar

ANOVA

Kadar_enzim_katalase_hepar

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.263	3	2.421	.362	.781
Within Groups	133.913	20	6.696		
Total	141.176	23			

Multiple Comparisons

Dependent Variable: Kadar_enzim_katalase_hepar

LSD

(I) Kelompok	(J) Kelompok	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
kontrol negatif (K1)	Kontrol positif jelantah (K2)	-1.28000	1.49395	.402	-4.3963	1.8363
	Kontrol positif ubi ungu (K3)	-1.31333	1.49395	.390	-4.4297	1.8030
	Perlakuan (K4)	-.52000	1.49395	.731	-3.6363	2.5963
Kontrol positif jelantah (K2)	kontrol negatif (K1)	1.28000	1.49395	.402	-1.8363	4.3963
	Kontrol positif ubi ungu (K3)	-.03333	1.49395	.982	-3.1497	3.0830
	Perlakuan (K4)	.76000	1.49395	.617	-2.3563	3.8763
Kontrol positif ubi ungu (K3)	kontrol negatif (K1)	1.31333	1.49395	.390	-1.8030	4.4297
	Kontrol positif jelantah (K2)	.03333	1.49395	.982	-3.0830	3.1497
	Perlakuan (K4)	.79333	1.49395	.601	-2.3230	3.9097
Perlakuan (K4)	kontrol negatif (K1)	.52000	1.49395	.731	-2.5963	3.6363
	Kontrol positif jelantah (K2)	-.76000	1.49395	.617	-3.8763	2.3563
	Kontrol positif ubi ungu (K3)	-.79333	1.49395	.601	-3.9097	2.3230

Katalase Otak

ANOVA

Kadar_enzim_katalase_otak

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.039	3	.013	.861	.477
Within Groups	.302	20	.015		
Total	.341	23			

POST HOC Katalase Otak

Multiple Comparisons

Dependent Variable: Kadar_enzim_katalase_otak

LSD

(I) Kelompok	(J) Kelompok	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
kontrol negatif(K1)	Kontrol positif jelantah (K2)	-.01667	.07096	.817	-.1647	.1313
	Kontrol positif ubi ungu (K3)	.05000	.07096	.489	-.0980	.1980
	Perlakuan (K4)	.08500	.07096	.245	-.0630	.2330
Kontrol positif jelantah (K2)	kontrol negatif(K1)	.01667	.07096	.817	-.1313	.1647
	Kontrol positif ubi ungu (K3)	.06667	.07096	.359	-.0813	.2147
	Perlakuan (K4)	.10167	.07096	.167	-.0463	.2497
Kontrol positif ubi ungu (K3)	kontrol negatif(K1)	-.05000	.07096	.489	-.1980	.0980
	Kontrol positif jelantah (K2)	-.06667	.07096	.359	-.2147	.0813
	Perlakuan (K4)	.03500	.07096	.627	-.1130	.1830
Perlakuan (K4)	kontrol negatif(K1)	-.08500	.07096	.245	-.2330	.0630
	Kontrol positif jelantah (K2)	-.10167	.07096	.167	-.2497	.0463
	Kontrol positif ubi ungu (K3)	-.03500	.07096	.627	-.1830	.1130

KONSUMSI UBI UNGU

Descriptives

	Kelompok			Statistic	Std. Error
Konsumsi_ubi_ungu	Kelompok kontrol ubi ungu (K3)	Mean		24.51736	1.055974
		95% Confidence Interval for Mean	Lower Bound	21.80289	
			Upper Bound	27.23183	
		5% Trimmed Mean		24.52485	
		Median		24.90417	
		Variance		6.690	
		Std. Deviation		2.586598	
		Minimum		20.558	
		Maximum		28.342	
		Range		7.783	
		Interquartile Range		3.624	
		Skewness		-.144	.845
		Kurtosis		1.013	1.741
	Kelompok perlakuan (K4)	Mean		22.90217	.815886
		95% Confidence Interval for Mean	Lower Bound	20.80487	
			Upper Bound	24.99948	
		5% Trimmed Mean		22.86111	
		Median		22.81304	
		Variance		3.994	
		Std. Deviation		1.998506	
		Minimum		20.843	
		Maximum		25.700	
		Range		4.857	
		Interquartile Range		3.829	
		Skewness		.285	.845
		Kurtosis		-1.772	1.741

Tests of Normality

	Kelompok	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Konsumsi_ubi_ungu	Kelompok kontrol ubi ungu (K3)	.212	6	.200*	.965	6	.854
	Kelompok perlakuan (K4)	.191	6	.200*	.910	6	.433

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

a. Lilliefors Significance Correction

INDEPENDENT T TEST "Konsumsi Ubi Ungu"

Group Statistics

	Kelompok	N	Mean	Std. Deviation	Std. Error Mean
Konsumsi_ubi_ungu	Kelompok kontrol ubi ungu (K3)	6	24.51736	2.586598	1.055974
	Kelompok perlakuan (K4)	6	22.90217	1.998506	.815886

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
Konsumsi_ubi_ungu	Equal variances assumed	.020	.891	1.210	10	.254	1.615187	1.334448	-1.358149	4.588523
	Equal variances not assumed			1.210	9.401	.256	1.615187	1.334448	-1.384020	4.614394

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
Kelompok kontrol negatif	Equal variances assumed	15.371	.003	3.435	10	.006	4.37000	1.27224	1.53527	7.20473
	Equal variances not assumed			3.435	5.010	.018	4.37000	1.27224	1.10162	7.63838

Kelompok kontrol positif jelantah	Equal variances assumed	9.267	.012	4.707	10	.001	5.63333	1.19685	2.96659	8.30008
	Equal variances not assumed			4.707	5.040	.005	5.63333	1.19685	2.56416	8.70251
Kelompok kontrol positif ubi ungu	Equal variances assumed	13.975	.004	6.055	10	.000	5.73333	.94681	3.62371	7.84295
	Equal variances not assumed			6.055	5.022	.002	5.73333	.94681	3.30274	8.16392
Kelompok perlakuan	Equal variances assumed	5.686	.038	6.857	10	.000	4.97500	.72551	3.35847	6.59153
	Equal variances not assumed			6.857	5.012	.001	4.97500	.72551	3.11136	6.83864

Korelasi Katalase Otak

Correlations

		KAdar Enzim Katalase pada	Kontrol Negatif	Kontrol Positif Jelantah	Kontrol Positif Ubi Ungu	Kelompok Perlakuan
KAdar Enzim Katalase pada	Pearson Correlation	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)		.	.	.	.
	N	6	6	6	6	6
Kontrol Negatif	Pearson Correlation	.[a]	1	.537	.000	.555
	Sig. (2-tailed)	.		.272	1.000	.253
	N	6	6	6	6	6

Kontrol Positif Jelantah	Pearson Correlation	.[a]	.537	1	-.098	.333
	Sig. (2-tailed)	.	.272		.853	.519
	N	6	6	6	6	6
Kontrol Positif Ubi Ungu	Pearson Correlation	.[a]	.000	-.098	1	.477
	Sig. (2-tailed)	.	1.000	.853		.339
	N	6	6	6	6	6
Kelompok Perlakuan	Pearson Correlation	.[a]	.555	.333	.477	1
	Sig. (2-tailed)	.	.253	.519	.339	
	N	6	6	6	6	6

a. Cannot be computed because at least one of the variables is constant.

Korelasi Katalase Hepar

Correlations

			KAdar Enzim Katalase pada	Kontrol Negatif	Kontrol Positif Jelantah	Kontrol Positif Ubi Ungu	Kelompok Perlakuan
Pearson	KAdar Enzim Katalase pada	Correlation Coefficient	.	.	.	.	.
		Sig. (2-tailed)	.	.	.	.	.
		N	6	6	6	6	6
	Kontrol Negatif	Correlation Coefficient	.	1.000	.886*	.657	-.200
		Sig. (2-tailed)	.	.	.019	.156	.704
		N	6	6	6	6	6
	Kontrol positif Jelantah	Correlation Coefficient	.	.886*	1.000	.371	.143
		Sig. (2-tailed)	.	.019	.	.468	.787
		N	6	6	6	6	6
	Kontrol positif Ubi	Correlation Coefficient	.	.657	.371	1.000	-.486

	Ungu	Sig. (2-tailed)	.	.156	.468	.	.329
		N	6	6	6	6	6
	Kelompok Perlakuan	Correlation Coefficient	.	-.200	.143	-.486	1.000
		Sig. (2-tailed)	.	.704	.787	.329	.
		N	6	6	6	6	6

*. Correlation is significant at the 0.05 level (2-tailed).

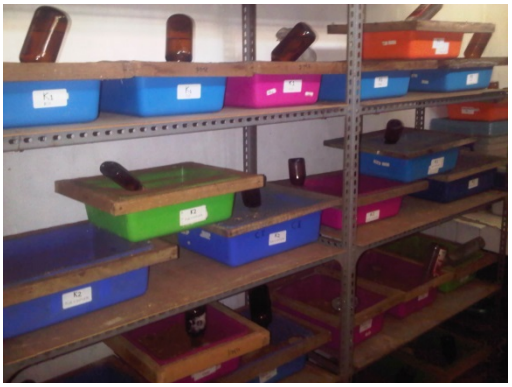
Korelasi Katalase Hepar dan Otak

Correlations

		Kelompok	Kadar_enzim_katalase_hepar	Kadar_enzim_katalase_otak
Kelompok	Pearson Correlation	1	.073	-.302
	Sig. (2-tailed)		.733	.152
	N	24	24	24
Kadar_enzim_katalase_hepar	Pearson Correlation	.073	1	-.362
	Sig. (2-tailed)	.733		.082
	N	24	24	24
Kadar_enzim_katalase_otak	Pearson Correlation	-.302	-.362	1
	Sig. (2-tailed)	.152	.082	
	N	24	24	24

DOKUMENTASI

Ubi ungu dibeli dari Pasar Bandungan, Kabupaten Semarang

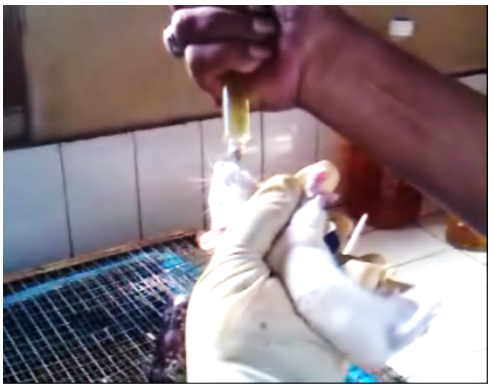


Hewan coba dikandangkan individual

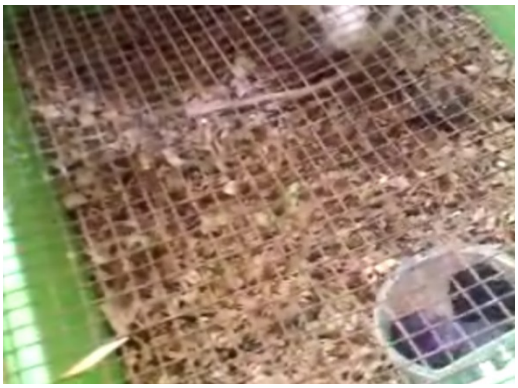
Ubi dikukus pada suhu 75^{o}C selama 20 menit

Ubi dipotong dadu dan ditimbang 30 gram

Proses pemanasam minyak goreng 200^{o}C selama 15 menit



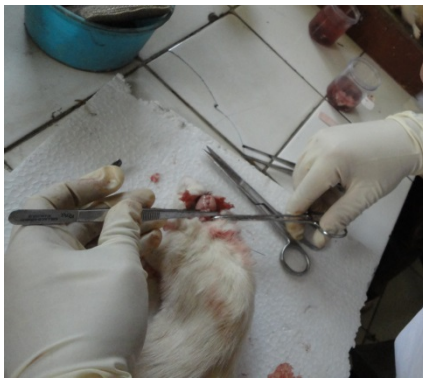
Pemberian minyak 3ml/hari per oral sonde



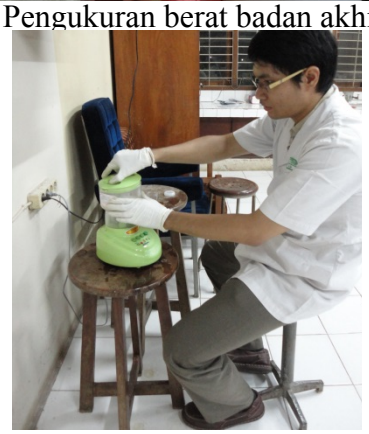
Pemberian ubi ungu kukus *ad libitum*

Sisa ubi ditimbang tiap esok paginya

Pengukuran berat badan akhir



Terminasi dan pengambilan otak wistar



Penghancuran sampel otak dengan blender