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DAFTAR PUSTAKA

ABD-ALLA, H. E.-S. 1993. Effect of coating process on seeds viability and some physiomechanical properties of Egyptian cotton. *Journal of Agricultural Sciences, Mansoura (Egypt),* 18**,** 2384-2396.

ABDALLA, A. E. & ROOZEN, J. P. 1999. Effect of plant extracts on the oxidative stability of sunflower oil and emulsion. *Food chemistry,* 64**,** 323-329.

AFANAS' EV, I. B., DCROZHKO, A. I., BRODSKII, A. V., KOSTYUK, V. A. & POTAPOVITCH, A. I. 1989. Chelating and free radical scavenging mechanisms of inhibitory action of rutin and quercetin in lipid peroxidation. *Biochemical pharmacology,* 38**,** 1763-1769.

AHMADI, H., SUPRAMANA, S. & SUHARTANTO, M. R. 2019. Keefektifan Perlakuan Air Panas terhadap Nematoda Ditylenchus destructor pada Umbi Bawang Putih. *Jurnal Fitopatologi Indonesia,* 15**,** 16-16.

ALADEDUNYE, F. A. & PRZYBYLSKI, R. 2009. Degradation and nutritional quality changes of oil during frying. *Journal of the American Oil Chemists' Society,* 86**,** 149-156.

ALIREZA, S., TAN, C., HAMED, M. & CHE MAN, Y. 2010. Effect of frying process on fatty acid composition and iodine value of selected vegetable oils and their blends. *International Food Research Journal,* 17**,** 295-302.

AMIN, S. 2015. Analisis minyak atsiri umbi bawang putih (Allium Sativum Linn.) menggunakan kromatografi gas spektrometer massa. *Jurnal Kesehatan Bakti Tunas Husada: Jurnal Ilmu-ilmu Keperawatan, Analis Kesehatan dan Farmasi,* 11**,** 37-45.

AMINAH, A., TOMAYAHU, N. & ABIDIN, Z. 2017. Penetapan kadar flavonoid total ekstrak etanol kulit buah alpukat (Persea Americana Mill.) dengan metode spektrofotometri Uv-Vis. *Jurnal Fitofarmaka Indonesia,* 4**,** 226-230.

ANDANA, A., TJAHJANI, S., DAN AMARIA 2020. PENGGUNAAN ANTIOKSIDAN SEBAGAI UPAYA UNTUK MENGHAMBAT PROSES OKSIDASI BIOETANOL DARI SINGKONG KARET (Manihot glaziovii). *UNESA Journal of Chemistry,* 9.

ANDINA, L., RIYANTO, R. & ROHMAN, A. 2014. Determination of anisidine value of red fruit oil under elevated temperature using FTIR spectroscopy and multivariate calibration. *International Food Research Journal,* 21.

ANINDI LUPITA NASYANKA, A. M. F., JANATUN NA'IMAH, M. S. R. A. A. M. F. K. & RISKHA AULIA APT., M. F. K. 2020. *PENGANTAR FITOKIMIA: D3 FARMASI 2020,* Penerbit Qiara Media.

ANJANI, E. D., BASWARSIATI, B. & DAMANHURI, D. 2019. Uji Daya Hasil Beberapa Varietas dan Aksesi Bawang Putih (Allium sativum L.) di Ngantang Kabupaten Malang. *Jurnal Produksi Tanaman,* 7.

AOCS 2017. Official Method Cd 3d-63. *Acid Value of fats and oils*.

ARIANI, D., YANTI, S. & SAPUTRI, D. S. 2017. Studi Kualitatif Dan Kuantitatif Minyak Goreng Yang Digunakan Oleh Penjual Gorengan Di Kota Sumbawa. *Jurnal Tambora,* 2.

UNIVERSITAS
GADJAH MADA
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

ARIANING, I. F. 2018. *Pengaruh Waktu Penggunaan Minyak Goreng Kelapa Sawit Terhadap Karakterisasi Trigliserida dan Crude Glycerol.* Universitas Muhammadiyah Sidoarjo.

ASMARA, A. P. 2019. Penentuan Bilangan Peroksida Minyak RBD (Refined Bleached Deodorized) Olein Pt. Phpo Dengan Metode Titrasi Iodometri. *Amina: Ar-Raniry Chemistry Journal,* 1**,** 79-83.

AVGERI, I., ZELIOU, K., PETROPOULOS, S. A., BEBELI, P. J., PAPASOTIROPOULOS, V. & LAMARI, F. N. 2020. Variability in bulb organosulfur compounds, sugars, phenolics, and pyruvate among greek garlic genotypes: Association with antioxidant properties. *Antioxidants,* 9**,** 967.

AYUCITRA, A., INDRASWATI, N., FRANCISCO, G. & YUDHA, A. 2013. Potensi senyawa fenolik bahan alam sebagai antioksidan alami minyak goreng nabati. *Widya Teknik,* 10**,** 1-10.

BADARY, O. A., TAHA, R. A., GAMAL EL-DIN, A. M. & ABDEL-WAHAB, M. H. 2003. Thymoquinone is a potent superoxide anion scavenger. *Drug and chemical toxicology,* 26**,** 87-98.

BAHNASAWY, A., EL-HADDAD, Z., EL-ANSARY, M. & SOROUR, H. 2004. Physical and mechanical properties of some Egyptian onion cultivars. *Journal of Food Engineering,* 62**,** 255-261.

BAHNASAWY, A. H. 2007. Some physical and mechanical properties of garlic. *International Journal of Food Engineering,* 3.

BANGUN, D. 2010. Memoar "duta besar" sawit Indonesia. *Jakarta: Penerbit Buku Kompas.*

BANURIAWAN, T. 2016. *Studi Komparasi Aktivitas Antioksidan Bawang Putih (Allium Sativum L.) Dengan Bawang Putih Tunggal Menggunakan Metode Ekstraksi Dan Sonikasi (Kajian Pengaruh Lama Perendaman).* Universitas Brawijaya.

BARBOZA, K., SALINAS, M. C., ACUÑA, C. V., BANNOUD, F., BERETTA, V., GARCÍA-LAMPASONA, S., BURBA, J. L., GALMARINI, C. R. & CAVAGNARO, P. F. 2020. Assessment of genetic diversity and population structure in a garlic (Allium sativum L.) germplasm collection varying in bulb content of pyruvate, phenolics, and solids. *Scientia Horticulturae,* 261**,** 108900.

BARNES, J., ANDERSON, L. & PHILLIPSON, J. 2007. Herbal medicine. (3rd edn) London. Pharmaceutical Press, London.

BENZIE, I. F. & STRAIN, J. J. 1996. The ferric reducing ability of plasma (FRAP) as a measure of "antioxidant power": the FRAP assay. *Analytical biochemistry,* 239**,** 70-76.

BORGES, L. L., ALVES, S. F., SAMPAIO, B. L., CONCEIÇÃO, E. C., BARA, M. T. F. & PAULA, J. R. 2013. Environmental factors affecting the concentration of phenolic compounds in Myrcia tomentosa leaves. *Revista Brasileira de Farmacognosia,* 23**,** 230-238.

BOSKOU, G., SALTA, F. N., CHIOU, A., TROULLIDOU, E. & ANDRIKOPOULOS, N. K. 2006. Content of trans, trans-2, 4-decadienal in

UNIVERSITAS GADJAH MADA
Peningkatan Stabilitas Oksidatif Minyak Goreng Sawit dengan Penambahan Ekstrak Bawang Putih (Allium sativum) pada Penggorengan Rendam
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

deep-fried and pan-fried potatoes. *European Journal of Lipid Science and Technology,* 108**,** 109-115.

BOZIN, B., MIMICA-DUKIĆ, N., ANACKOV, G., ZLATKOVIC, B. & IGIC, R. 2008. Antioxidant properties of methanol extracts of wild garlics (genus Allium L., sect. Allium). *Planta Medica,* 74**,** PA121.

BPS 2018. Survei Sosial Ekonomi Nasional, Konsumsi Kalori dan Protein Penduduk Indonedia Tahun 1993 sampai dengan Tahun 2018. Jakarta.

BPS 2019. Ringkasan Eksekutif Pengeluaran dan Konsumsi Penduduk Indonesia Berdasarkan Hasil Susenas September 2019.

BRAND-WILLIAMS, W., CUVELIER, M.-E. & BERSET, C. 1995. Use of a free radical method to evaluate antioxidant activity. *LWT-Food science and Technology,* 28**,** 25-30.

BRAVI, E., PERRETTI, G., FALCONI, C., MARCONI, O. & FANTOZZI, P. 2017. Antioxidant effects of supercritical fluid garlic extracts in sunflower oil. *Journal of the Science of Food and Agriculture,* 97**,** 102-107.

BSN 2013. SNI 3741:2013 Minyak Goreng. *In:* BSN (ed.). Jakarta.

BUDIJANTO, S. & SITANGGANG, A. B. 2010. Kajian keamanan pangan dan kesehatan minyak goreng. *Jurnal Pangan,* 19**,** 361-372.

BUTT, M. S., SULTAN, M. T., BUTT, M. S. & IQBAL, J. 2009. Garlic: nature's protection against physiological threats. *Critical reviews in food science and nutrition,* 49**,** 538-551.

CHANDA, S., KUSHWAHA, S. & TIWARI, R. K. 2011. Garlic as food, spice and medicine: A perspective. *Journal of Pharmacy Research,* 4**,** 1857-1860.

CHE MAN, Y. & TAN, C. 1999. Effects of natural and synthetic antioxidants on changes in refined, bleached, and deodorized palm olein during deep-fat frying of potato chips. *Journal of the American Oil Chemists' Society,* 76**,** 331-339.

CHEN, S., SHEN, X., CHENG, S., LI, P., DU, J., CHANG, Y. & MENG, H. 2013. Evaluation of garlic cultivars for polyphenolic content and antioxidant properties. *Plos One,* 8**,** e79730.

CHOE, E. 2006. Comprehensive Reviews in Food Science and Technology. *Food Science and Technology,* 5.

CHONG, Y. M., CHANG, S. K., SIA, W. C. M. & YIM, H. S. 2015. Antioxidant efficacy of mangosteen (Garcinia mangostana Linn.) peel extracts in sunflower oil during accelerated storage. *Food bioscience,* 12**,** 18-25.

DAMANIK, A. 2008. Analisa Kadar Asam Lemak Bebas Dari Crude Palm Oil (CPO) Pada Tangki Timbun Di PT Sarana Agro Nusantara. *Skripsi, Departemen kimia fakultas matematika dan ilmu pengetahuan alam, Universitas Sumatera Utara, Medan.*

DANA, D. & SAGUY, I. S. 2001. Frying of nutritious foods: obstacles and feasibility. *Food Science and Technology Research,* 7**,** 265-279.

DEVY, N. F. & SUPRIYANTO, A. 2019. Eksplorasi, karakterisasi, dan evaluasi beberapa klon bawang putih lokal.

FAO. 2005. Codex Alimentarius. General Standard for Food Additives Codex, Rev. 6 Available from: http://www.codexalimentarius.net/download/standards/4/CXS_192e.pdf.

UNIVERSITAS
GADJAH MADA
Peningkatan Stabilitas Oksidatif Minyak Goreng Sawit dengan Penambahan Ekstrak Bawang Putih (Allium sativum) pada Penggorengan Rendam
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

FAO 2017. Food and Agriculture Organisation of the United Nations, Rome, Italy. FAOSTAT.

FARHATAIN, R. 2012. *Analisis Kualitas Fisis Minyak Goreng Sebelum Pemakaian dan Setelah Pemakaian.* Universitas Islam Negeri Alauddin Makassar.

FAUZIAH, S. S. & NAJAMUDDIN, U. 2013. Analisis Kadar Asam Lemak Bebas Dalam Gorengan Dan Minyak Bekas Hasil Penggorengan Makanan Jajanan Di Workshop UNHAS. *FKM Unhas***,** 1-9.

FEBRIANSYAH, R. 2007. Mempelajari pengaruh penggunaan berulang dan Aplikasi adsorben terhadap kualitas minyak dan tingkat penyerapan minyak pada kacang sulut. *Skripsi, Fakultas Teknologi Pertanian, Institut Pertanian Bogor, Bogor.*

FERYANA, I. & SUSENO, S. H. 2014. Pemurnian Minyak Ikan Makerel Hasil Samping Penepungan Dengan Netralisasi Alkali. *Jurnal Pengolahan Hasil Perikanan Indonesia*, 17 (3), 207-214.

FITRIYAH, J. 2015. Pengaruh Komposisi Bahan Terhadap Kualitas Manisan Bawang Putih. *Thesis, Fakultas Teknik, Universitas Negeri Semarang, Semarang.*

GEBREYOHANNES, G. 2013. Fate of ß-asarone in Ayurvedic Sodhana process of Vacha. *J ayuveda Integr Med Reid*.

GIRSANG, E., KISWANDONO, A. A., AZIZ, H., CHAIDIR, Z. & ZEIN, R. Serbuk biji salak (Salacca zalacca) sebagai biosorben dalam memperbaiki kualitas minyak goreng bekas. Dalam Prosiding SNPS (Seminar Nasional Pendidikan Sains), 2015. 583-594.

GRANATO, D. & MASSON, M. L. 2010. Instrumental color and sensory acceptance of soy-based emulsions: a response surface approach. *Food Science and Technology,* 30**,** 1090-1096.

GRITTER, R. J., BOBBIT, J. M. & SCHWARTING, A. E. 1991. Pengantar kromatografi. *Edisi Kedua, Penerbit ITB, Bandung,* 1**,** 14-18.

GUNSTONE, F. D. A. P., F D 1997. *Lipids Technologies and Application,* New York, Marcel Dekker Inc.

HARBORNE, J. 1987. Metode fitokimia: Penuntun cara modern menganalisis tumbuhan. *Bandung: Penerbit ITB,* 78.

HARIYADI, P. 2014. *Mengenal Minyak Sawit dengan Beberapa Karakter Unggulnya*, Jakarta Pusat, GAPKI (Gabungan Pengusaha Kelapa Sawit Indonesia).

HARJONO, V. E. 2020. Pengaruh Konsentrasi Bawang Putih Bubuk Dan Metode Pengolahan Terhadap Aktivitas Antioksidan, Polifenol, Flavonoid, Vitamin C, Dan Warna Pada Rumput Laut Merah. *Thesis, Universitas Katolik Soegijapranata Semarang.*

HARRIS, J., COTTRELL, S., PLUMMER, S. & LLOYD, D. 2001. Antimicrobial properties of Allium sativum (garlic). *Applied microbiology and biotechnology,* 57**,** 282-286.

HARYONO, H., SIRIN FAIRUS, S. F., YAVITA SARI, Y. S. & IKA RAKHMAWATI, I. R. 2010. Pengolahan Minyak Goreng Kelapa Sawit Bekas menjadi Biodiesel Studi Kasus: Minyak Goreng Bekas dari KFC

UNIVERSITAS
GADJAH MADA
Peningkatan Stabilitas Oksidatif Minyak Goreng Sawit dengan Penambahan Ekstrak Bawang Putih (Allium sativum) pada Penggorengan Rendam
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

Dago Bandung. *Pengolahan Minyak Goreng Kelapa Sawit Bekas menjadi Biodiesel Studi Kasus: Minyak Goreng Bekas dari KFC Dago Bandung*.

HAYYAN, A., ALAM, M. Z., MIRGHANI, M. E., KABBASHI, N. A., HAKIMI, N. I. N. M., SIRAN, Y. M. & TAHIRUDDIN, S. 2011. Reduction of high content of free fatty acid in sludge palm oil via acid catalyst for biodiesel production. *Fuel Processing Technology,* 92**,** 920-924.

HELVICH, K. 1990. Official methods of analysis. Association of official analytical chemists.

HERNANDEZ, E. M. & KAMAL-ELDIN, A. 2013. *Processing and nutrition of fats and oils*, John Wiley & Sons.

HERNAWAN, U. E. & SETYAWAN, A. D. 2003. Senyawa organosulfur bawang putih (Allium sativum L.) dan aktivitas biologinya. *Biofarmasi,* 1**,** 65-76.

HILMAN, Y. & HIDAYAT, A. 1997. Budidaya bawang putih di dataran tinggi. Balai Penelitian Tanaman Sayuran.

HO, C.-T. 1992. Phenolic compounds in food: an overview.

HUI, Y. H. 1996. *Edible oil and fats products: Products and application technology*, New York, USA, John Wiley and Sons, Inc.

ILMI, I. M. B., KHOMSAN, A. & MARLIYATI, S. A. 2015. Kualitas minyak goreng dan produk gorengan selama penggorengan di rumah tangga Indonesia. *Jurnal Aplikasi Teknologi Pangan,* 4.

IQBAL, S. & BHANGER, M. 2007. Stabilization of sunflower oil by garlic extract during accelerated storage. *Food Chemistry,* 100**,** 246-254.

ISMAIL, A., MARJAN, Z. M. & FOONG, C. W. 2004. Total antioxidant activity and phenolic content in selected vegetables. *Food chemistry,* 87**,** 581-586.

KAVERI, G. & THIRUPATHI, V. 2015. Studies on geometrical and physical properties of CO 4 onion bulb (Allium cepa lvar. aggregatum don.). *Int. J. Rec. Sci. Res,* 6**,** 2897-2902.

KEMENDAG. 2020. *Profil Komoditas Minyak Goreng* [Online]. Available: https://ews.kemendag.go.id/Rdesign_komoditi.aspx [Accessed 09/05 2021].

KETAREN 2012. Pengantar Teknologi Minyak dan Lemak Pangan Edisi 1. Jakarta: UI press.

KODERA, Y., SUZUKI, A., IMADA, O., KASUGA, S., SUMIOKA, I., KANEZAWA, A., TARU, N., FUJIKAWA, M., NAGAE, S. & MASAMOTO, K. 2002. Physical, chemical, and biological properties of S-allylcysteine, an amino acid derived from garlic. *Journal of agricultural and food chemistry,* 50**,** 622-632.

KONG, A.-N. T., YU, R., LEI, W., MANDLEKAR, S., TAN, T.-H. & UCKER, D. S. 1998. Differential activation of MAPK and ICE/Ced-3 protease in chemical-induced apoptosis. *Restorative neurology and neuroscience,* 12**,** 63-70.

KUSHARTO, C. M., SRIMIATI, M., TANZIHA, I. & SUSENO, S. H. 2015. Efek penambahan vitamin E terhadap stabilitas minyak ikan lele. *Jurnal Pengolahan Hasil Perikanan Indonesia,* 18**,** 321-328.

UNIVERSITAS
GADJAH MADA
Peningkatan Stabilitas Oksidatif Minyak Goreng Sawit dengan Penambahan Ekstrak Bawang Putih (Allium sativum) pada Penggorengan Rendam
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

KUSNANDAR, F. 2010. Mengenal Sifat Lemak dan Minyak. *Bogor: Departemen Ilmu dan Teknologi Pangan, Institut Pertanian Bogor*.

LAELIA, R. & KURNIA, P. 2019. Pengaruh frekuensi penggorengan terhadap angka asam dan angka peroksida pada berbagai jenis minyak. *Ilmu Gizi Indonesia,* 3**,** 23-34.

LAWSON, L. D., WOOD, S. G. & HUGHES, B. G. 1991. HPLC analysis of allicin and other thiosulfinates in garlic clove homogenates. *Planta medica,* 57**,** 263-270.

LOGHAVI, M., SOURI, S. & KHORSANDI, F. Physical and Mechanical Properties of Almond (Prunus dulcis l. cv. 7Shahrood). 2011 Louisville, Kentucky, August 7-10, 2011, 2011. American Society of Agricultural and Biological Engineers, 1.

LU, M., YUAN, B., ZENG, M. & CHEN, J. 2011. Antioxidant capacity and major phenolic compounds of spices commonly consumed in China. *Food Research International,* 44**,** 530-536.

MALINÍKOVÁ, E., KUKLA, J., KUKLOVÁ, M. & BALÁŽOVÁ, M. 2013. Altitudinal variation of plant traits: morphological characteristics in Fragaria vesca L.(Rosaceae). *Annals of Forest Research,* 56**,** 79-89.

MATTHÄUS, B. 2007. Use of palm oil for frying in comparison with other high-stability oils. *European Journal of Lipid Science and Technology,* 109**,** 400-409.

MIETHING, H. 1988. HPLC-analysis of the volatile oil of garlic bulbs. *Phytotherapy Research,* 2**,** 149-151.

MOHSENIN, N. 1986. Physical properties of plant and animal materials. Gordon and Breach Science Publishers. *New York*.

MONDONG, F. R. 2015. Skrining Fitokimia dan Uji Aktivitas Antioksidan Ekstrak Etanol Daun Patikan Emas (Euprorbia prunifolia Jacq.) dan Bawang Laut (Proiphys amboinensis (L.) Herb). *Jurnal MIPA,* 4**,** 81-87.

MONK, P. M. S. 2008. *Physical Chemistry: Understanding our Chemical World*, Wiley.

MONGKOLSILP, S., PONGBUPAKIT, I., SAE-LEE, N. & SITTHITHAWORN, W. 2004. Radical scavenging activity and total phenolic content of medicinal plants used in primary health care. *SWU J Pharm Sci,* 9**,** 32-35.

MORTON, I. 1998. Geography and history of the frying process. *Grasas y aceites,* 49**,** 247-249.

MOULIA, M., SYARIEF, R., IRIANI, E. & KUSUMANINGRUM, H. 2018. Antimicrobial of Garlic Extract. *PANGAN,* 27**,** 55-66.

MULYATININGSIH, E. 2007. Teknik-Teknik Dasar Memasak. *Yogyakarta: Universitas Negeri Yogyakarta*.

NADIAH, N. & UTHUMPORN, U. 2015. Determination of phenolic and antioxidant properties in tea and spent tea under various extraction method and determination of catechins, caffeine and gallic acid by HPLC. *behaviour,* 11**,** 12.

NAJIB, A. 2018. *Ekstraksi Senyawa Bahan Alam*, Deepublish.

UNIVERSITAS GADJAH MADA
Peningkatan Stabilitas Oksidatif Minyak Goreng Sawit dengan Penambahan Ekstrak Bawang Putih (Allium sativum) pada Penggorengan Rendam
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

NERÍN, C., TOVAR, L. & SALAFRANCA, J. 2008. Behaviour of a new antioxidant active film versus oxidizable model compounds. *Journal of Food Engineering,* 84**,** 313-320.

NORIKO, N., ELFIDASARI, D., PERDANA, A. T., WULANDARI, N. & WIJAYANTI, W. 2012. Analisis penggunaan dan syarat mutu minyak goreng pada penjaja makanan di food court UAI. *Jurnal Al-azhar Indonesia seri sains dan teknologi,* 1**,** 147-154.

NURHASNAWATI, H. 2017. Penetapan kadar asam lemak bebas dan bilangan peroksida pada minyak goreng yang digunakan pedagang gorengan di jl. aw sjahranie samarinda. *Jurnal Ilmiah Manuntung,* 1**,** 25-30.

NURSALIKAH, A. 2020. *Alasan Pengusaha Impor Bawang Putih Hanya dari China* [Online]. republika.co.id. Available: https://www.republika.co.id/berita/q5n8i1366/alasan-pengusaha-impor-bawang-putih-hanya-dari-china [Accessed 16 Mei 2021].

NUUTILA, A. M., PUUPPONEN-PIMIÄ, R., AARNI, M. & OKSMAN-CALDENTEY, K.-M. 2003. Comparison of antioxidant activities of onion and garlic extracts by inhibition of lipid peroxidation and radical scavenging activity. *Food chemistry,* 81**,** 485-493.

O'BREIN, R. 2009. Fats and Oils: formulating and Processing for Applications. Richard D. O'Brien, editor. CRC Press, Baca Raton, FL.

OKUBO, T., YOKOYAMA, Y., KANO, K. & KANO, I. 2003. Cell death induced by the phenolic antioxidant tert-butylhydroquinone and its metabolite tert-butylquinone in human monocytic leukemia U937 cells. *Food and chemical toxicology,* 41**,** 679-688.

OU, B., HUANG, D., HAMPSCH-WOODILL, M., FLANAGAN, J. A. & DEEMER, E. K. 2002. Analysis of antioxidant activities of common vegetables employing oxygen radical absorbance capacity (ORAC) and ferric reducing antioxidant power (FRAP) assays: a comparative study. *Journal of agricultural and food chemistry,* 50**,** 3122-3128.

PACURAR, M. & KREJCI, G. 2010. *Garlic Consumption and Health*, Nova Science Publishers.

PAQUOT, C., & HAUTFENNE, A 1987. *IUPAC Standard Methods for the Analysis of Oils, Fats and Derivatives 1st Supplement to the 7th Edition*, Oxford, England, Pergamon Press.

PATHARE, P. B., OPARA, U. L. & AL-SAID, F. A.-J. 2013. Colour measurement and analysis in fresh and processed foods: a review. *Food and bioprocess technology,* 6**,** 36-60.

PERESTRELO, R., SILVA, C., SILVA, P. & CÂMARA, J. S. 2017. Global volatile profile of virgin olive oils flavoured by aromatic/medicinal plants. *Food Chemistry,* 227**,** 111-121.

PERMANA, A. W., WIDAYANTI, S. M., PRABAWATI, S. & SETYABUDI, D. A. 2017. Sifat Antioksidan Bubuk Kulit Buah Manggis (Garcinia Mangostana L.) Instan Dan Aplikasinya Untuk Minuman Fungsional.

PETROPOULOS, S., FERNANDES, Â., BARROS, L., CIRIC, A., SOKOVIC, M. & FERREIRA, I. C. 2018. Antimicrobial and antioxidant properties of various Greek garlic genotypes. *Food chemistry,* 245**,** 7-12.

UNIVERSITAS
GADJAH MADA
Peningkatan Stabilitas Oksidatif Minyak Goreng Sawit dengan Penambahan Ekstrak Bawang Putih (Allium sativum) pada Penggorengan Rendam
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

POKORNÝ, J. 1991. Natural antioxidants for food use. *Trends in Food Science & Technology,* 2**,** 223-227.

POKORNY, J., YANISHLIEVA, N. & GORDON, M. H. 2001. *Antioxidants in food: Practical applications*, Cambridge, UK, Woodhead Publishing Ltd.

PRASONTO, D., RIYANTI, E. & GARTIKA, M. 2017. Uji aktivitas antioksidan ekstrak bawang putih (Allium sativum). *ODONTO: Dental Journal,* 4**,** 122-128.

PRATIWI, I. 2009. Uji Antibakteri Ekstrak Kasar Daun Acalypha indica Linn. Terhadap Bakteri Salmonella choleraesuis dan Salmonella typhimurium. *Skripsi, Fakultas MIPA, Universitas Sebelas Maret*.

PRAYOGO, B. K. H. 2019. *Pengaruh Penambahan Senyawa Antioksidan Dalam Penggorengan Kerupuk Bawang Terhadap Kualitas Minyak Goreng Dan Produk The Effects Of Antioxidant Addition During Frying Of Garlic Crackers On The Quality Of Frying Oil And The Product. Skripsi*. Unika Soegijapranata: Semarang

PRIOR, R. 2004. Absorption and metabolism of anthocyanins: potential health effects. *Phytochemicals: Mechanisms of action***,** 1-19.

PRIOR, R. L., WU, X. & SCHAICH, K. 2005. Standardized methods for the determination of antioxidant capacity and phenolics in foods and dietary supplements. *Journal of agricultural and food chemistry,* 53**,** 4290-4302.

PURWANINGSIH, E. 2005. *Manfaat Bawang Putih*, Ganeca Exact.

PUSDATIN 2019. Buletin Konsumsi Pangan. 10**,** 35.

RAHARDJO, A., MANAF, Y., DAMANIK AMBARITA, M. T. & NUSANTORO, B. 2020. Minyak Goreng untuk Pengolahan Pangan. Gadjah Mada University Press.

RISMAWATI 2009. *Pengaruh Waktu Deodorisasi Terhadap Olein dan Stearin Minyak Sawit Merah Serta Aplikasinya Sebagai Medium Penggorengan Tempe Dan Ubi Jalar Putih*, Bogor, IPB Press.

RIYADI, A. 2009. Kendali proses deodorisasi dalam permurnian minyak sawit merah skala pilot plant [tesis]. *Bogor (ID): Institut Pertanian*.

ROBY, M. H. H., SARHAN, M. A., SELIM, K. A.-H. & KHALEL, K. I. 2013. Evaluation of antioxidant activity, total phenols and phenolic compounds in thyme (Thymus vulgaris L.), sage (Salvia officinalis L.), and marjoram (Origanum majorana L.) extracts. *Industrial Crops and Products,* 43**,** 827-831.

RODIL, R., QUINTANA, J. B. & CELA, R. 2012. Oxidation of synthetic phenolic antioxidants during water chlorination. *Journal of hazardous materials,* 199**,** 73-81.

ROMANO, R., FILOSA, G., PIZZOLONGO, F., DURAZZO, A., LUCARINI, M., SEVERINO, P., SOUTO, E. B. & SANTINI, A. 2021. Oxidative stability of high oleic sunflower oil during deep-frying process of purple potato Purple Majesty. *Heliyon,* 7**,** e06294.

RUSDY, A. 2010. Pengaruh pemberian ekstrak bawang putih terhadap mortalitas keong mas. *Jurnal Floratek,* 5**,** 172-179.

UNIVERSITAS
GADJAH MADA
Peningkatan Stabilitas Oksidatif Minyak Goreng Sawit dengan Penambahan Ekstrak Bawang Putih (Allium sativum) pada Penggorengan Rendam
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

RYU, K., IDE, N., MATSUURA, H. & ITAKURA, Y. 2001. N α-(1-deoxy-d-fructos-1-yl)-l-arginine, an antioxidant compound identified in aged garlic extract. *The Journal of nutrition,* 131**,** 972S-976S.

SABEENA FARVIN, K. H., GREJSEN, H. D. & JACOBSEN, C. 2012. Potato peel extract as a natural antioxidant in chilled storage of minced horse mackerel (Trachurus trachurus): Effect on lipid and protein oxidation. *Food Chemistry,* 131**,** 843-851.

SADEGHI, Z., VALIZADEH, J., SHERMEH, O. A. & AKABERI, M. 2015. Antioxidant activity and total phenolic content of Boerhavia elegans (choisy) grown in Baluchestan, Iran. *Avicenna journal of phytomedicine,* 5**,** 1.

SANDRAKIRANA, R. & HADIATRY, M. The diversity of garlic bulbs and cloves quantitative characteristics of local garlic collection of East Java AIAT. IOP Conference Series: Earth and Environmental Science, 2020. IOP Publishing, 012029.

SANTOSO, H. B. 1988. *Bawang Putih,* Yogyakarta, Kanisius.

SAPUTRO A. H., D. S. 2014. Arrest Potential for Radical 2, 2-Diphenyl-1-Pikril Hidrazil (DPPH) by Pisang Susu (Musa Paradisiaca L." Susu") And Pisang Ambon (Musa paradisiaca L." Ambon"). *Traditional Medicine Journal,* 19**,** 7-13.

SAYUTI, I. K. & YENRINA, I. R. 2015. *Antioksidan, Alami dan Sintetik,* Padang, Andalas University Press.

SEMB, T. N. 2012. *Analytical methods for determination of the oxidative status in oils.* Institutt for bioteknologi.

SERJOUIE, A., TAN, C. P., MIRHOSSEINI, H. & CHE MAN, Y. 2010. Effect of vegetable-based oil blends on physicochemical properties of oils during deep-fat frying. *American journal of food technology,* 5**,** 310-323.

SHAH, M. A., BOSCO, S. J. D. & MIR, S. A. 2014. Plant extracts as natural antioxidants in meat and meat products. *Meat science,* 98**,** 21-33.

SHAHIDI, F., ALASALVAR, C. & LIYANA-PATHIRANA, C. M. 2007. Antioxidant phytochemicals in hazelnut kernel (Corylus avellana L.) and hazelnut byproducts. *Journal of agricultural and food chemistry,* 55**,** 1212-1220.

SHAHIDI, F., ZHONG, H. J. & AMBIGAIPALAN, P. 2005. Antioxidants: regulatory status. *Bailey's industrial oil and fat products***,** 1-21.

SHAHIDI, F. & ZHONG, Y. 2010. Novel antioxidants in food quality preservation and health promotion. *European Journal of Lipid Science and Technology,* 112**,** 930-940.

SIAHAAN, M. R. 2018. Penentuan Bilangan Asam dan Asam Lemak Bebas (ALB) dari Minyak Kacang Kedelai.

SIKNUN, M. A., GHUNU, G. F. & AL AMIN, Z. 2014. PEMULSAAN ORGANIK TERHADAP INTENSITAS SERANGAN BERCAK UNGU SERTA PRODUKSI BAWANG PUTIH VARIETAS LUMBU PUTIH DAN LUMBU HIJAU. *Agrika,* 8.

SINGH, D. K. & SINGH, V. K. 2008. Pharmacological Effects of Allium Sativum L.(Garlic. *Annual Review of Biomedical Sciences,* 10**,** 6-26.

UNIVERSITAS
GADJAH MADA
Peningkatan Stabilitas Oksidatif Minyak Goreng Sawit dengan Penambahan Ekstrak Bawang Putih (Allium sativum) pada Penggorengan Rendam
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

SISWOYO, T. A. & ARDIYATI, T. 2009. AKTIVITAS DAN STABILITAS RADICAL SCAVENGING L-ASKORBIL PALMITAT HASIL SINTESIS SECARA ENZIMATIK [Activity and Stability of Radical Scavenging of L-Palmitate Synthesized Enzymatically]. *Jurnal Teknologi dan Industri Pangan,* 20**,** 124-124.

SNI 2013. *Minyak Goreng,* Jakarta, BSN (Badan Standarisasi Nasional).

SOEMIATI, A. 2013. Perbandingan Metode Ekstraksi Maserasi dan Sokletasi Terhadap Kadar Piperin Buah Cabe Jawa (Piperis retrofracti fructus).

SOURI, E., AMIN, G., FARSAM, H. & BARAZANDEH, T. M. 2008. Screening of antioxidant activity and phenolic content of 24 medicinal plant extracts.

STERLING, S. J. & EAGLING, D. R. 2001. Agronomics and allicin yield of Australian grown garlic (Allium sativum). *Acta Horticulturae,* 555**,** 63-73.

SUDARMAJI, S., B. HARYONO, DAN SUHARDI 1989. *Analisa Bahan Makanan dan Pertanian,* Yogyakarta, Gadjah Mada University Press.

SUDJATINI, S. 2020. PENGARUH CARA PENGOLAHAN TERHADAP AKTIVITAS ANTIOKSIDAN EKSTRAK BAWANG PUTIH (Allium sativum L.) VARIETAS KATING DAN SINCO. *AGROTECH: JURNAL ILMIAH TEKNOLOGI PERTANIAN,* 3.

SUIRAOKA, I. P. 2012. Penyakit degeneratif. *Yogyakarta: Nuha Medika***,** 45-51.

SULISTYORINI, A. 2015. *Potensi antioksidan dan antijamur ekstrak umbi bawang putih (Allium sativum Linn.) dalam beberapa pelarut organik.* Universitas Islam Negeri Maulana Malik Ibrahim.

SUMIATI, T. 2008. Pengaruh pengolahan terhadap mutu cerna protein ikan mujair (Tilapia mossambica). *Program Studi Gizi Masyarakat dan Sumberdaya Keluarga, Fakultas Pertanian. Institut Pertanian Bogor, Bogor*.

SUN-WATERHOUSE, D., THAKORLAL, J. & ZHOU, J. 2011. Effects of added phenolics on the storage stability of avocado and coconut oils. *International journal of food science & technology,* 46**,** 1575-1585.

SUROSO, A. S. 2013. Kualitas minyak goreng habis pakai ditinjau dari bilangan peroksida, bilangan asam dan kadar air. *Indonesian Pharmaceutical Journal,* 3**,** 77-88.

SUTANTO, S. & PURWANTO, M. G. M. Rapid reversed-phase high performance liquid chromatography assay of Tert-butylhydroquinone content in food products. IOP Conference Series: Earth and Environmental Science, 2019. IOP Publishing, 012038.

TAUFIK, M. & SEFTIONO, H. 2018. Karakteristik Fisik dan Kimia Minyak Goreng Sawit Hasil Proses Penggorengan dengan Metode Deep-Fat Frying. *Jurnal Teknologi,* 10**,** 123-130.

TEH, S.-S. & BIRCH, J. 2013. Physicochemical and quality characteristics of cold-pressed hemp, flax and canola seed oils. *Journal of Food Composition and Analysis,* 30**,** 26-31.

TEPE, B., SOKMEN, M., AKPULAT, H. A. & SOKMEN, A. 2005. In vitro antioxidant activities of the methanol extracts of five Allium species from Turkey. *Food chemistry,* 92**,** 89-92.

TOREL, J., CILLARD, J. & CILLARD, P. 1986. Antioxidant activity of flavonoids and reactivity with peroxy radical. *Phytochemistry,* 25**,** 383-385.

UNIVERSITAS
GADJAH MADA
Peningkatan Stabilitas Oksidatif Minyak Goreng Sawit dengan Penambahan Ekstrak Bawang Putih (Allium sativum) pada Penggorengan Rendam
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

TRILAKSANI, W. 2003. Antioksidan: jenis, sumber, mekanisme kerja dan peran terhadap kesehatan. *IPB, Bogor*.

TUDISCO, R., CHIOFALO, B., ADDI, L., PRESTI, V. L., RAO, R., CALABRO, S., MUSCO, N., GROSSI, M., CUTRIGNELLI, M. & MASTELLONE, V. 2015. Effect of hydrogenated palm oil dietary supplementation on milk yield and composition, fatty acids profile and Stearoyl-CoA desaturase expression in goat milk. *Small Ruminant Research,* 132**,** 72-78.

VACLAVIK, V. A., CHRISTIAN, E. W. & CHRISTIAN, E. W. 2008. *Essentials of food science*, Springer.

VATSYAYAN, S., BRAR, P. & DHALL, R. 2013. GENETIC VARIABILITY STUDIES IN GARLIC (*ALLIUM SATIVUM* L.). *Annals of Horticulture,* 6**,** 315-320.

WAHYUNI, S. D. 2021. *Sifat Fisik, Kimia Dan Tingkat Kesukaan Bawang Putih Goreng Dengan Perbedaan Metode Penggorengan Dan Varietas.* Universitas Mercu Buana Yogyakarta.

WANG, S. N., SUI, X. N., WANG, Z. J., QI, B. K., JIANG, L. Z., LI, Y., WANG, R. & WEI, X. 2016. Improvement in thermal stability of soybean oil by blending with camellia oil during deep fat frying. *European Journal of Lipid Science and Technology,* 118**,** 524-531.

WARNER, K. 2002. Chemistry of frying oils. *FOOD SCIENCE AND TECHNOLOGY-NEW YORK-MARCEL DEKKER-***,** 205-222.

WASOWICZ, E., GRAMZA, A., HES, M., JELEN, H., KORCZAK, J., MALECKA, M., MILDNER-SZKUDLARZ, S., RUDZINSKA, M., SAMOTYJA, U. & ZAWIRSKA-WOJTASIAK, R. 2004. Oxidation of lipids in food. *Polish journal of food and nutrition sciences,* 13.

WINARNO, F. G. 1986. *Kimia Pangan dan Gizi*, Jakarta, PT. Gramedia Pustaka Utama.

WINARNO, F. 2004. *Kimia Pangan dan Gizi*, Jakarta, PT Gramedia Pustaka Utama.

WINARSI, H. 2007. *Antioksidan alami dan radikal*, Kanisius.

WINDARWATI, S. 2011. *Pemanfaatan Fraksi Aktif Ekstrak Tanaman Jarak Pagar (Jatropha curcas Linn.) sebagai zat antimikroba dan antioksidan dalam sediaan kosmetik.* Tesis Tidak Diterbitkan, Institut Pertanian Bogor.

WINDRASARI, C., PRAMUDYA KURNIA, S. & FITRIANA MUSTIKANINGRUM, S. G. 2016. *Aktivitas Antibakteri Sari Bawang Putih (Allium Sativum Linn.) Kating Dan Sin Chung Terhadap Pertumbuhan Bakteri Pseudomonas Aeruginosa Perusak Ikan Air Tawar.* Universitas Muhammadiyah Surakarta.

XU, T.-T., LI, J., FAN, Y.-W., ZHENG, T.-W. & DENG, Z.-Y. 2015. Comparison of oxidative stability among edible oils under continuous frying conditions. *International Journal of Food Properties,* 18**,** 1478-1490.

XU, X., LIU, A., HU, S., ARES, I., MARTÍNEZ-LARRAÑAGA, M.-R., WANG, X., MARTÍNEZ, M., ANADÓN, A. & MARTÍNEZ, M.-A. 2021. Synthetic phenolic antioxidants: Metabolism, hazards and mechanism of action. *Food Chemistry***,** 129488.

UNIVERSITAS
GADJAH MADA
Peningkatan Stabilitas Oksidatif Minyak Goreng Sawit dengan Penambahan Ekstrak Bawang Putih (Allium sativum) pada Penggorengan Rendam
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

YAHYA, A.-H., CHONG, G.-H. & TAN, C.-P. 2014. The phytochemical properties of a new citrus hybrid (Citrus hystrix× Citrus microcarpa). *Science Asia,* 40**,** 121-4.

YANG, D., WU, G., LU, Y., LI, P., QI, X., ZHANG, H., WANG, X. & JIN, Q. 2021. Comparative analysis of the effects of novel electric field frying and conventional frying on the quality of frying oil and oil absorption of fried shrimps. *Food Control***,** 108195.

YONDRA, A. D., JOSE, C., & TERUNA, H. Y. 2014. Total Fenolik, Flavonoid Serta Aktivitas Antioksidan Ekstrak n-Heksana, Diklorometan dan Metanol *Amaranthus spinosus* L EM5-Bawang Putih. *JOM FMIPA,* 1**,** 359-369.

BSN 2013. SNI 3741:2013 Minyak Goreng. *In:* BSN (ed.). Jakarta.

BUTT, M. S., SULTAN, M. T., BUTT, M. S. & IQBAL, J. 2009. Garlic: nature's protection against physiological threats. *Critical reviews in food science and nutrition,* 49**,** 538-551.

KAVERI, G. & THIRUPATHI, V. 2015. Studies on geometrical and physical properties of CO 4 onion bulb (Allium cepa lvar. aggregatum don.). *Int. J. Rec. Sci. Res,* 6**,** 2897-2902.

KODERA, Y., SUZUKI, A., IMADA, O., KASUGA, S., SUMIOKA, I., KANEZAWA, A., TARU, N., FUJIKAWA, M., NAGAE, S. & MASAMOTO, K. 2002. Physical, chemical, and biological properties of S-allylcysteine, an amino acid derived from garlic. *Journal of agricultural and food chemistry,* 50**,** 622-632.

LAWSON, L. D., WOOD, S. G. & HUGHES, B. G. 1991. HPLC analysis of allicin and other thiosulfinates in garlic clove homogenates. *Planta medica,* 57**,** 263-270.

RACE, S. 2009. Antioxidants: The truth about BHA, BHT, TBHQ and other antioxidants used as food additives. *Tigmor Book: London*.

RAHARDJO, A., MANAF, Y., DAMANIK AMBARITA, M. T. & NUSANTORO, B. 2020. Minyak Goreng untuk Pengolahan Pangan. Gadjah Mada University Press.

SERJOUIE, A., TAN, C. P., MIRHOSSEINI, H. & CHE MAN, Y. 2010. Effect of vegetable-based oil blends on physicochemical properties of oils during deep-fat frying. *American journal of food technology,* 5**,** 310-323.

SUN-WATERHOUSE, D., THAKORLAL, J. & ZHOU, J. 2011. Effects of added phenolics on the storage stability of avocado and coconut oils. *International journal of food science & technology,* 46**,** 1575-1585.

YOSHIDA, H., KATSUZAKI, H., OHTA, R., ISHIKAWA, K., FUKUDA, H., FUJINO, T. & SUZUKI, A. 1999. An organosulfur compound isolated from oil-macerated garlic extract, and its antimicrobial effect. *Bioscience, biotechnology, and biochemistry,* 63**,** 588-590.

YOSIE, A., EFFENDY, M., SIFZIZUL, T. & HABSAH, M. 2011. Antibacterial, radical-scavenging activities and cytotoxicity properties of Phaleria macrocarpa (scheff.) Boerl. Leaves in hepg2 cell lines. *International Journal of Pharmaceutical Sciences and Research,* 2**,** 1693.

UNIVERSITAS
GADJAH MADA
Peningkatan Stabilitas Oksidatif Minyak Goreng Sawit dengan Penambahan Ekstrak Bawang Putih (Allium sativum) pada Penggorengan Rendam
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Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

YULIA, E. & NURAENI, F. 2017. Kualitas Minyak Goreng Curah yang Berada di Pasar Tradisional di Daerah Jabotabek pada Berbagai Penyimpanan. *Ekologia: Jurnal Ilmiah Ilmu Dasar dan Lingkungan Hidup,* 17**,** 29-38.

ZAHRA, S. L., DWILOKA, B. & MULYANI, S. 2013. Pengaruh penggunaan minyak goreng berulang terhadap perubahan nilai gizi dan mutu hedonik pada ayam goreng. *Animal Agriculture Journal,* 2**,** 253-260.

ZHANG, H., JIANG, L., YE, S., YE, Y. & REN, F. 2010. Systematic evaluation of antioxidant capacities of the ethanolic extract of different tissues of jujube (Ziziphus jujuba Mill.) from China. *Food and chemical toxicology,* 48**,** 1461-1465.

ZHANG, X. 1999. *WHO Monographs on Selected Medicinal Plants: Bulbus Alii Sativii.*, Geneva, World Health Organization.

ZURAIDA, Z., SULISTIYANI, S., SAJUTHI, D. & SUPARTO, I. H. 2017. Fenol, flavonoid, dan aktivitas antioksidan pada ekstrak kulit batang pulai (Alstonia scholaris R. Br). *Jurnal Penelitian Hasil Hutan,* 35**,** 211-219.