UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Adebowale, K. O., Afolabi, T. A. and Olu-Owolabi, B. I. 2006. Functional, physicochemical and retrogradation properties of sword bean (*Canavalia gladiata*) acetylated and oxidized starches. *Carbohydrate Polymers*. 65: 93–101.

Ai, Y., Hasjim, J. and Jane, J. 2013. Effects of lipids on enzymatic hydrolysis and physical properties of starch. *Carbohydrate Polymers*. 92(1): 120–127.

Ali, A., Wani, T. A., Wani, I. A. and Masoodi, F. A. 2014. Comparative study of the physico-chemical properties of rice and corn starches grown in Indian temperate climate. *Journal of the Saudi Society of Agricultural Sciences*. 15 (1): 75–82.

Alireza, S., Tan, C. P., Hamed, M. and Che Man, Y. B. 2010. Effect of frying process on fatty acid composition and iodine value of selected vegetable oils and their blends. *International Food Research Journal*. 302: 295–302.

Amini, M. A. and Razavi, S. M. A. 2016. A fast and efficient approach to prepare starch nanocrystals from normal corn starch. *Food Hydrocolloids*. 57: 132–138.

Amini, A. M., Razavi, S. M. A. and Mortazavi, S. A. 2015. Morphological, physicochemical, and viscoelastic properties of sonicated corn starch. *Carbohydrate Polymers*. 122: 282-292.

Angellier, H., Choisnard, I., Molina-Boisseau, S., Ozil, P. and Dufresne, A. 2004. Optimization of the preparation of aqueous suspensions of waxy maize starch nanocrystals using a response surface methodology. *Biomacromolecules*. 4: 1545-1551.

Angellier, H., Putaux, J.-L., Molina-Boisseau, S., Dupeyre, D. and Dufresne, A. 2005. Starch Nanocrystal fillers in an acrylic polymer matrix. *Macromolecule Symposium*. 221: 95-104.

Apriani, D., Gusnedi, dan Darvina, Y. 2013. Studi tentang nilai viskositas madu hutan dari beberapa daerah di sumatera barat untuk mengetahui kualitas madu. *Pillar of Physics*. 2: 91-98.

Ashokkumar, M. 2015. Applications of ultrasound in food and bioprocessing. *Ultrasonics Sonochemistry*. 25: 17-23.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Ball, S. G. and Morell, M. K. 2003. From bacterial glycogen to starch : understanding the biogenesis of the plant starch granule. *Annual Review of Plant Biology*. 54 (1): 207–233.

Bashir, K. and Aggarwal, M. 2019. Physicochemical, structural and functional properties of natove and irradiated starch: a review. *J. Food Sci Technol*.

Bel Haaj, S., Magnin, A., Pétrier, C. and Boufi, S. 2013. Starch nanoparticles formation via high power ultrasonication. *Carbohydrate Polymers*. 92 (2): 1625–1632.

Benavent-gil, Y. and Rosell, C. M. 2017. Comparison of porous starches obtained from different enzyme types and levels. *Carbohydrate Polymer*. 157: 533–540.

Bertolini, A.C., Mestres, C. and Colonna, P. 2000. Rheological properties of acidified and UV-irradiated starches. *Starch/Starke*. 52: 340-344.

Bertolini, A.C., Mestres, C., Colonna, P. and Raffi, J. 2001. Free radical formation in UV and gamma-irradiated cassava starch. *Carbohydrate Polymers*. 44: 269-271.

Bertolini, A.C., Mestres, C., Lourdin, D., Valle, G.D. and Colonna, P. 2001. Relationship between thermomechanical properties and baking expansion of sour cassava starch (*Polvilho azedo*). *Journal of the Science of Food and Agriculture*. 81: 429–435.

Bertolini, A.C., Mestres, C., Raffi, J., Bule´on, A., Lerner, D. and Colonna, P. 2001. Photodegradation of cassava and corn starches. *Journal of Agricultural and Food Chemistry*. 49: 675-682.

Buléon, A., Colonna, P., Planchot, V. and Ball, S. 1998. Mini review. Starch granules: Structure and biosynthesis. *International Journal of Biological Macromoecules*. 23: 85-112.

Bustillos-Rodríguez, J. C., Tirado-Gallegos, J. M., Ordóñez-García, M., Zamudio-Flores, P. B., Ornelas-Paz, J. de. J. and Acosta-Muñiz, C. H. 2019. Physicochemical, thermal and rheological properties of three native corn starches. *Food Science Technology*. 39: 149–57.

Capron I. and Cathala B. 2013. Surfactantefree high internal phase emulsions stabilized by cellulose nanocrystals. *Biomacromolecules.* 14 (2): 291-296.

Cardwell, G., Bornman, J., James, A. and Black, L. 2018. A Review of mushrooms as a potential source of dietary vitamin D. *Nutrients*. 10 (10): 1498.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Carneiro-da-Cunha, M. G., Cerqueira M. A., Souza B. W. S., Teixeira J. A. and Vicente A. A. 2011. Insluence of concentration, ionic strength and pH on zeta potential and mean hydrodynamic diameter of edible polysaccharide solutions envisaged for multinanolayered films production. *Carbohydrate Polymers*. 85 (3): 522–528.

Chan, H. T., Bhat, R. and Karim, A. A. 2010. Effects of sodium dodecyl sulphate and sonication treatment on physicochemical properties of starch. *Food Chemistry*. 120 (3): 703–709.

Chang, Y. G., Song A. X., Gao Y. G., Shi Y. H., Lin X. J., Cao X. T., Lin D. H. and Hu H. Y. 2006. Solution structure of the ubiquitin-associated domain of human BMSC-UbP and its complex with ubiquitin. *Protein Science*. 15: 1248-1259.

Chang, Y., Yan, X., Wang, Q., Ren, L., Tong, J. and Zhou, J. 2017. High efficiency and low cost preparation of size controlled starch nanoparticles through ultrasonic treatment and precipitation. *Food Chemistry*. 227: 369–375.

Chellaram, C., Murugaboopathi, G., John, A.A., Sivakumar, R., Ganesan, S., Krithika, S. and Priya, G. 2014. Significance of nanotechnology in food industri. *Procesia APCBEE*. 8: 109-113.

Chen, H., Weiss, J. and Shahidi, F. 2006. Nanotechnology in nutraceuticals and functional foods. *Food Technology*. 60: 30-36

Chen, L., Remondetto, G.E and Subirade, M. 2006. Food protein-based materials as nutraceutical delivery systems. *Trends Food Science And Technology*. 17: 271-283.

Cheng, Y.-c., Guo J.-j., Liu X.-h., Sun A.-h., Xu G.-j. and Cui P. 2011. Preparation of uniform titania microspheres with good electrorheological performance and their size effect. *Journal of Materials Chemistry*. 21: 5051-5056.

Chevalier, Y. and Bolzinger M. A. 2013. Emulsions stabilized with solid nanoparticles: pickering emulsions. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*. 439: 23–34.

Chiotelli, E., Pilosio, G. and Le Meste, M. 2002. Effect of sodium chloride on the gelatinization of starch: A multimeasurement study. *Biopolymers*. 63: 41–58.

Chong, W. T., Uthormporn, U., Karim, A. A. and Cheng, L. H. 2013. The influence of ultrasound on the degree of oxidation of hypochlorite-oxidized corn starch. *LWT-Food Science and Technology*. 50: 439–443.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Chung, C., Degner B. and McClements D. J. 2012. Rheology and microstructure of bimodal particulate dispersions: Model for foods containing fat droplets and starch granules. *Food Research International*. 48: 641–649.

Copeland, L., Blazek J., Salman H. and Tang M. C. 2009. Form and functionality of starch. *Food Hydrocolloid.* 23: 1527-1534.

Corre, D., Le, Bras, J. and Dufresne, A. 2010. Starch Nanoparticles: A Review. *Biomacromolecules*. 11: 1139-1153.

Dai, L., Qiu, C., Xiong, L. and Sun, Q. 2015. Characterisation of corn starch-based films reinforced with taro starch nanoparticles. *Food Chemistry*. 174: 82-88.

Damat., Haryadi., Marsono, Y. and Cahyanto, M.N. 2008. Efek dan konsentrasi butirat anhidrida selama butirilisasi pati garut. *Agritech*. 28: 63-69.

Dar, M. A., Ingle, A. and Rai, M. 2013. Enhanced antimicrobial activity of silver nanoparticles synthesized by Cryphonectria sp evaluated singly and in combination with antibiotics. *Nanomedicine: Nanotechnology, Biology, and Medicine.* 9: 105–110.

Degrois, M., Gallant, D., Baldo, P., and Guilbot, A. 1974. The effects of ultrasound on starch grains.

Demiate, I. M., Dupuy, N., Huvenne, J. P., Cereda, M. P. and Wosiacki, G. 2000. Relationship between baking behavior of modified cassava starches and starch chemical structure determined by FTIR spectroscopy. *Carbohydrate Polymers*. 42 (2): 149-158.

Dias, A. R. G., Zavarese, E. da R., Helbig, E., Moura, F. A. de M., Vargas, C. G. and Ciacco, C. F. 2011. Oxidation of fermented cassava starch using hydrogen peroxide. *Carbohydrate Polymers*. 86: 185-191.

Dickinson, E. 2012. Use of nanoparticles and microparticles in the formation and stabilization of food emulsions. *Trends in Food Science and Technology*. 24 (1): 4–12.

Dokić L., Krstonošić V. and Nikolić I. 2012. Physicochemical characteristics and stability of oil-in-water emulsions stabilized by OSA starch. *Food Hydrocolloids*. 29 (1): 185-192.

Ding, Y., Zheng, J., Xia, X., Ren, T. and Kan, J. 2016. Box-Behnken design for the optimization of nanoscale retrograded starch formation by high-power ultrasonication. *LWT-Food Science and Technology*. 67: 206-213.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Dufresne, A. 2014. Crystalline starch based nanoparticles. *Current Opinion in Colloid and Interface Science.* 19: 397-408.

Dufresne, A., Cavaille, J-Y. and Helbert, W. 1996. Communications to the Editor. New Nanocomposie Materials: Microcrystalline starch reinforced thermoplastic. *Macromolecules*. 29: 7624-7626.

Dura, A., Baszczak W. and Rosell C. M. 2014. Functionality of porous starch obtained by amylase or amyloglucosidase treatments. *Carbohydrate Polymers*. 101: 837–845.

El-Sheikh, M. A., Ramadan, M. A. and El-Shafie, A. 2010. Photo-oxidation of rice starch. Part I: Using hydrogen peroxide. *Carbohydrate Polymers*. 80 (1): 266–269.

Fang, Y.-Y., Wang, L.-J., Li, D., Li, B.-Z., Bhandari, B., Chen, X.D. and Mao, Z.-H., 2008. Preparation of crosslinked starch microspheres and their drug loading and releasing properties. *Carbohydrate Polymers*. 74: 379-384.

Fiedorowicz, M., Tomasik, P., Cracow (Poland), You, S. and Lim S-T. 1999. Molecular distribution and pasting properties of UV-irradiated corn starches. *Starch/Starke.* 4: 126-131.

Fonseca, L. M., Gonçalves, J. R., El-Halal, S. L. M., Pinto, V. Z., Dias, A. R. G., Jacques, A. C. and Zavareze, E. da R. 2014. Oxidation of potato starch with different sodium hypochlorite concentrations and its effect on biodegradable films. *LWT - Food Science and Technology*. 60 (2): 714-720.

Fujii, S., Cai, Y., Weaver, J.V.M. and Armes, S.P. 2005. Syntheses of shell cross-linked micelles using acidic ABC triblock copolymers and their application as pH responsive particulate emulsifiers. *Journal of the American chemical Society*. 127 (20): 7304-7305.

Gallant, D., Degrois, M., Sterling, C. and Guilbot, A. 1972. Microscopic effects of ultrasound on the structure of potato starch. *Starke.* 4: 116-123.

García, N. L., Lamanna, M., D'Accorso, N., Dufresne, A., Aranguren, M. and Goyanes, S. 2012. Biodegradable materials from grafting of modified PLA onto starch nanocrystals. *Polymer Degradation and Stability*. 97: 2021-2026.

Ge, S., Xiong, L., Li, M., Liu, J., Yang, J., Chang, R., Liang, C. and Sun, Q. 2017. Characterizations of pickering emulsions stabilized by starch nanoparticles: Influence of starch variety and particle size. *Food Chemistry*. 234: 339-347.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Gelders, G. G., Vanderstukken, T. C., Goesaert, H., and Delcour, J. A. 2004. Amylose – lipid complexation : a new fractionation method. *Carbohydrate Polymers*. *56*: 447–458.

Goncalves, P. M., Norena, C. P. Z., Silveira, N. P.d. and Brandelli, A. 2014. Characterization of starch nanoparticles obtained from Araucaria angustifolia seeds by acid hydrolysis and ultrasound. *LWT-Food Science and Technology*. 58: 21-27.

Grieser, F., Ashokkumar, M. and Sostaric, J. Z. 1999. Sonochemistry and sonoluminescence in colloidal systems. *Sonochemistry and Sonoluminescence.* 345 – 362.

Gustafsson, J., Mikkola P., Jokinen M. and J. B. Rosenholm. 2000. The influence of pH and NaCl on the zeta potential and rheology of anatase dispersions. *Colloids and Surfaces A: Physicochemical and Engineering Aspect.* 175: 349–359.

Harmon, R.E., Gupta, S.K. and Jonson, J. 1971. Oxidation of starch by hydrogen peroxide in the presence of UV light. Part I. *Die Starke*. 23: 347-349.

Harmon, R. E., Gupta, S. K. and Johnson, J. 1972. Oxidation of Starch by Hydrogen Peroxide in the Presence of UV Light - Part. II. *Starch - Stärke*. 23(10): 347–349.

Hebeish, A., El-Rafie, M. H., EL-Sheikh, M. A. and El-Naggar, M. E. 2014. Ultra-Fine Characteristics of Starch Nanoparticles Prepared Using Native Starch With and Without Surfactant, J. Inorg. Organomet. *Polym. Mater*. 24: 515–524.

Ho, K. W., Ooi C. W., Mwangi W. M., Leong W. F., Tey B. T. and Han E. –S. 2016. Comparison of self-aggregated chitosan particles preparated with and without ultrasonication pretreatment as pickering emulsifier. *Food Hydrocolloids*. 52: 827-834.

Hong, L., Cheng, L., Gan, C., Lee, C. Y. and Peh, K. K. 2018. Evaluation of starch propionate as emulsion stabiliser in comparison with octenylsuccinate starch. *LWT - Food Sci Technology*.

Hoover, R. and Manuel, H. 1996. Effect of heat-moisture treatment on the structure and physicochemical properties of legume starches. *Food Research. International.* 29: 731–750.

Hoover, R. 2000. Acid treated starches. *Food Reviews International.* 16. 369-392. Marcel Dekker Inc.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Hornig, S., Heinze, T., Becer, C. R. and Schubert, U. S. 2009. Synthetic polymeric nanoparticles by nanoprecipitation. *Journal of Materials Chemistry*. 19(23): 3838–3840.

Isbell, H. S. and Frush, H. L. 1987. Mechanisms for hydroperoxide degradation of disaccharides and related compounds. *Carbohydrat Research*. 161: 181–93.

Jafari, S. M., Assadpoor, E., Bhandari, B. and He, Y. 2008. Nano-particle encapsulation of fish oil by spray drying. *Food Research International.* 41 (2): 172–183.

Jayakody, L. and Hoover, R. 2002. The effect of lintnerization on cereal starch granules. *Food Research International.* 35: 665-680.

Jia, X. J., Xu R. R., Shen W., Xie M. X., Abid M., Jabbar S. and Wu, T. 2015. Stabilizing oil-in-water emulsion with amorphous cellulose. *Food Hydrocolloids*. 43: 275-282.

Jiang, S., Liu, C., Han, Z., Xiong, L. and Sun, Q. 2016. Evaluation of rheological behavior of starch nanocrystals by acid hydrolysis and starch nanoparticles by self-assembly: A comparative study. *Food Hydrocolloid.* 52: 914-922.

Joye, I. J. and McClements, D. J. 2013. Production of nanoparticles by anti-solvent precipitation for use in food systems. *Trends Food Science Technology*. 34: 109-123.

Kalashnikova, H., Bizot, B. and Cathala I. 2011. Capron, new pickering emulsions stabilized by bacterial cellulose nanocrystals. *Langmuir*. 27: 7471-7479.

Karmvir., Ritika. and Baljeet, R. 2018. Physico-chemical, textural and crystallinity properties of oxidized, cross- linked and dual- modified white sorghum starch. *International Food Research Journal*. 25: 2104-2111.

Kho, K. and Hadinoto, K. 2010. Aqueous re-dispersibility characterization of spraydried hollow spherical silica nano-aggregates. *Powder Technology*. 198: 354–363

Kim, J.-Y., Park, D.-J. and Lim, S.-T. 2008. Fragmentation of waxy rice starch granules by enzymatiz hydrolysis. *Cereal Chemistry*. 85(2): 182-187.

Kim, H., Lee, I., Kwon, Y., Kim, B. C., Ha, S. and Lee, J. H. 2011. Immobilization of glucose oxidase into polyaniline nanofiber matrix for biofuel cell applications. *Biosensors and Bioelectronics*. 26 (9): 3908-3913.

UNIVERSITAS GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Kim, H. Y., Lee, J. H., Kim, J. Y., Lim, W. J. and Lim, S. T. 2012. Characterization of nanoparticles prepared by acid hydrolysis of various starches. *Starch/Staerke*. 64: 367–373.

Kim, H.-Y., Han, J.-A., Kweon, D.-K., Park, J.-D. and Lim, S.-T. 2013. Effect of ultrasonic treatments on nanoparticle preparation of acid-hydrolyzed waxy maize starch. *Carbohydrate Polymers*. 93: 582–588.

Kim, H.-Y., Han, J.-A., Park, J.-D., Kim, T.-S. and Lim, S.-T. 2013. Preparation of crystalline starch nanoparticles using cold acid hydrolysis and ultrasonication. *Carbohydrate Polymers*. 98: 295–301.

Kim, H. Y., Park, S. S. and Lim, S. T. 2015. Preparation, characterization and utilization of starch nanoparticles. *Colloids Surfaces B Biointerfaces*. 126: 607–620.

Kimura, H., Sakurai, M., Sugiyama, T., Tsuchida, A., Okubo, T. and Masuko, T. 2011. Dispersion state and rheology of hectorite particles in water over a broad range of salt and particle concentrations. *Rheologica Acta*. 50: 159-168.

Köksoy, A. and Kılıc, M. 2003. Effects of water and salt level on rheological properties of ayran, a Turkish yoghurt drink. *International Dairy Journal*. 13: 835-839.

Kuakpetoon, D. and Wang Y. J. 2001. Characterization of different starches oxidized by hypochlorite. *Starch-Stärke*. 53: 211-218.

Kuakpetoon, D. and Wang, Y. J. 2006. Structural characteristics and physicochemical properties of oxidized corn starches varying in amylose content. *Carbohydrate Research*. 341(11): 1896–1915.

Kuakpetoon, D. and Wang, Y. J. 2008. Locations of hypochlorite oxidation in corn starches varying in amylose content. *Carbohydrate Polymers*. 343: 90–100.

Kumoro, A. C., Retnowati, D. S., Ratnawati, R. and Budiyati, C. S. 2016. H_2O_2/UV photo-oxidation of gadung (Dioscorea hispida Dennst.) starch and its product physicochemical characterization. *Oriental Journal of Chemistry*. 32:1993–1998.

Lamanna, M., Morales, N. J., Garcia, N. L. and Goyanes, S. 2013. Development and characterization of starch nanoparticles by gamma radiation: Potential application as starch matrix filler. *Carbohydrate Polymers*. 97(1): 90–97.

Lawal, O. S. 2004. Composition, physicochemical properties and retrogradation characteristics of native, oxidized, acetylated and acid-thinned new cocoyam (Xanthosoma sagittifolium) starch. *Food Chemistry*. 87: 205–218.

UNIVERSITAS GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

LeCorre, D., Vahanian, E., Dufresne, A. and Bras, J. 2011. Enzymatic pretreatment for preparing starch nanocrystals. *Biomacromolecules.* 13: 132-137.

LeCorre, D., Vahanian, E., Dufresne, A. and Bras, J. 2012. Enzymatic pretreatment for preparing starch nanocrystals. *Biomacromolecules*. 13: 132-137.

Leunissen, M.E., Blaaderen, A.V., Hollingsworth, A.D., Sullivan, M.T. and Chaikin, P.M. 2007. Electrostatics at the oil–water interface, stability, and order in emulsions and colloids. *Proc. Natl. Acad. Sci. U.S.A.* 104: 2585-2590.

Li, Y., Hou, W.-G. and Shen, S.-L. 2009. Rheological behavior of aqueous suspensions containing cationic starch and aluminum magnesium hydrotalcite-like compound in the presence of different electrolytes. Colloids and Surfaces A: *Physicochemical and Engineering Aspects*. 350: 109-113.

Li, J., Baroja-Fernández, E., Bahaji, A., Muñoz, F. J., Ovecka, M. and Montero, M. 2013. Enhancing sucrose synthase activity results in increased levels of starch and adp-glucose in maize (zeamays l.) Seed endosperms. *Plant Cell Physiol*. 54: 282–94.

Liu, D., Wu, Q., Chen, H. and Chang, P. R. 2009. Transitional properties of starch colloid with particle size reduction from micro to nanometer. *Journal of Colloid and Interface Science.* 339: 117-124.

Liu, Y., Zhao, G., Ren, J., Zhao, M. and Yang, B. 2011. Effect of denaturation during extraction on the conformational and functional properties of peanut protein isolate. *Innovative Food Science & Emerging Technologies*. 12: 375-380.

Liu, J., Wang, B., Lin, L., Zhang, J., Liu, W., Xie, J. and Ding, Y. 2014. Functional, physicochemical properties and structure of cross-linked oxidized maize starch. *Food Hydrocolloid.* 36: 45 – 52.

Lukasiewicz, M., Bednarz, S., Ptaszek, A., Gerlich, I., Bednarz, A., Bogdal, D. and Achremowicz, B. 2007. Microwave assisted oxidative degradation of starch - estimation of degree of oxidation of the modified biopolymer. *11th International Electronic Conference on Synthetic Organic Chemistry (ECSOC-11).* 1-30.

Ma, X., Jian, R., Chang, P.R. and Yu, J. 2008. Fabrication and characterization of citric acid-modified starch nanoparticles/plasticized-starch composites. *Biomacromolecules*. 9: 3314-3320.

Maflahah, I. 2010. Analisis pembuatan pati jagung (maizena) berbasis neraca massa. *Embryo*. 7(1): 40-45.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Manelius, R. and Bule, A. 2000. The substitution pattern in cationised and oxidised potato starch granules. *Carbohydrate Polymers*. 329: 621-633.

Marcotte, M., Taherian, A. R., Trigui, M. and Ramaswamy, H. S. 2001. Evaluation of rheological properties of selected salt enriched food hydrocolloids. *Journal of Food Engineering.* 48 (2): 157-167.

Masschelein, W. J. 2002. Ultraviolet light in water and wastewater sanitation. Lewis Publisher USA is an imprint CRC Press LLC.

McClements D. J. 2007. Critical review of techniques and methodologies for characterization of emulsion stability. *Critical Reviews in Food Science and Nutrition.* 47(7): 611-649.

Miao, M., Li, R., Jiang, B., Cui, S. W., Lu, K. and Zhang, T. 2014. Structure and digestibility of endosperm water-soluble α-glucans from different sugary maize mutants. *Food Chemistry*. 143: 156-162.

Mua, J. P. and Jackson, D. S. 1997. Fine structure of corn amylose and amylopectin fractions with various molecular weights. *Journal Agriculture Food Chemistry*. 45: 3840-3847.

Muflihati, I., Marseno, D.W. and Pranoto, Y. 2019. Oxidation of oven-dried cassava starch using hydrogen peroxide and UV-C irradiation to improve frying expansion. *Journal of Indonesian Food and Nutrition Progress*. 16 (1): 9-14.

Muthukrishnan, S., Bhakya, S., Senthil Kumar, T. and Rao, M. V. 2015. Biosynthesis, characterization and antibacterial effect of plant-mediated silver nanoparticles using Ceropegia thwaitesii - An endemic species. *Industrial Crops and Products*. 63:119-124.

Niba, L. L., Bokanga, M. M., Jackson, F. L., Schilimme, D. S., and Li, B. W. 2001. *Physicochemical properties and starch granular characteristics of flour from various manihot esculenta (cassava) genotypes*. University of Maryland: Food Chemistry and Toxicology. *Journal of Food Science*. 67(5): 1701-1705.

Parovuori, P., Hamunen, A., Forssell, P., Autio, K. and Poutanen, K. 1995. Oxidation of potato starch by hydrogen peroxide. *Starch/Starke*. 47: 19-23.

Powell, P. O., Sullivan, M. A., Sweedman, M. C., Stapleton, D. I., Hasjim, J. and Gilbert, R. G. 2014. Extraction, isolation and characterisation of phytoglycogen from su-1 maize leaves and grain. *Carbohydrate Polymers*. 101(1): 423-431.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Putaux, J. L., Molina-Boisseau, S., Momaur, T. and Dufresne, A. 2003. Platelet nanocrystals resulting from the disruption of waxy maize starch granules by acid hydrolysis. *Biomacromolecules*. 4: 1198-1202.

Qiu, C., Li, X., Ji, N., Qin, Y., Sun, Q. and Xiong, L. 2015. Food Hydrocolloids Rheological properties and microstructure characterization of normal and waxy corn starch dry heated with soy protein isolate. *Food Hydrocolloids*. 48: 1-7.

Raffi, J. and Agnel, J. 1983. INLSuence of the physical structure of irradiated starches on their electron spin resonance spectra kinectics. *Journal Physical. Chemistry*. 87: 2369-2373.

Raffi, J., Agnel, J. P., Boizot, C., Thiery, C. and Vincent, P. 1985. Glucose oligomers as models to elucidate the starch radiolysis mechanism. *Starch*. 37: 228-231.

Rahayu, L. H. dan Purnavita, S. 2014. Pengaruh suhu dan waktu adsorbs terhadap sifat kimia-fisika minyak goreng bekas hasil pemurnian menggunakan adsorben ampas pati aren dan bentonit. *Momentum.* 10 (2): 35-41.

Rousseau, D. 2013. Trends in structuring edible emulsions with pickering fat crystals. *Current Opinion in Colloid and Interface Science*. 18 (4): 283-291.

Roy, P., Das, S., Bera, T., Mondol, S. and Mukherjee, A. 2010. Andrographolide nanoparticles in leishmaniasis: characterization and in vitro evaluations. *International Journal of Nanomedicine*. 5: 1113-1121.

Saari, H., Herafivar, K., Rayner, M., Wahlgren, M. and Sjoo, M. 2016. Preparation and characterization of starch particles for used in pickering emulsions. *Cereal Chemistry*. 93 (2): 116-124.

Saleh, N., Kim, H.-J., Phenrat, T., Matyjaszewski, K., Tilton, R. D. and Lowry, G. V. 2008. Ionic strength and composition affect the mobility of surface-modified FeO nanoparticles in water-saturated sand columns. *Environmental Science & Technology*. 42: 3349-3355.

Sánchez-Rivera, M. M., García-Suárez, F. J. L., Velázquez Del Valle, M., Gutierrez-Meraz, F. and Bello-Pérez, L. A. 2005. Partial characterization of banana starches oxidized by different levels of sodium hypochlorite. *Carbohydrate Polymers*. 62 (1): 50-56.

Sandhu, K. S., Kaur, M., Singh, N. and Lim, S. T. 2008. A comparison of native and oxidized normal and waxy corn starches: Physicochemical, thermal, morphological and pasting properties. *LWT-Food Science and Technology*. 41 (6): 1000-1010.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Sangseethong, K., Lertphanich, S. and Sriroth, K. 2009. Physicochemical properties of oxidized cassava starch prepared under various alkalinity levels. *Starch/Staerke*. 61 (2): 92-100.

Sangseethong, K., Termvejsayanon, N. and Klanarong, S. 2010. Characterization of physicocjemical properties of hypochlorite- and peroxide-oxidized cassava starches. *Carbohydrate Polymers*. 82: 446-453.

Sauter, C., Emin, M. A., Schuchmann, H. P. and Tavman, S. 2008. Influence of hydrostatic pressure and sound ampllitudo on the ultrasound induced dispersion and deagglomeration of nanoparticles. *Ultrasonic Sonocehemistry*. 15: 517-523.

Scoponi, M. and Ghiglione, C. 1997. Photo-oxidation mechanism of poly (2,6-dimethyl-1,4-phenyleneoxide). *Die Angewandte Makromolekulare Chemie* 252. 4525 : 237–256. Paper presented at the Nineteenth Annual International Conference on Advances in the Stabilization and Degradation of Polymers in Luzern. Switzerland. 9-11.

Sekhon, B. S. 2010. Food nanotechnology-an overview. *Nanotechnology Science Application*. 3: 1-15.

Serjouie, A., Tan, C. P., Mirhosseini, H. and 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 (2): 295-302.

Shi, A-M., Li, D., Wang, L.-J., Li, B.-Z. and Adhikari, B. 2011. Preparation of starch-based nanoparticles through high pressure homogenization and miniemulsions cross-linking: INLSuence of various process parameters on particle size and stability. *Carbohydrate Polymers*. 83: 1604-1610.

Shi, A., Li, D., Wang, L. and Adhikari, B. 2012. The effect of NaCl on the rheological properties of suspension containing spray dried starch nanoparticles. *Carbohydrate Polymers*. 90: 1530-1537.

Shi, A.-M., Wang, L.-J., Li, D. and Adhikari, B. 2013. Suspensions of vacuum-freeze dried starch nanoparticles: INLSuence of NaCl on their rheological properties. *Carbohydrate Polymers*. 94: 782-790.

Singh, N., Sandhu, K. S. and Kaur, M. 2005. Physicochemical properties including granular morphology, amylose content, swelling and solubility, thermal and pasting properties of starches from normal, waxy, high amylose and sugary corn. *Progress in Food Biopolymer Research*. 1: 43-55.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Singh, S., Singh, N., Ezekiel, R. and Kaur, A. 2011. Effects of gamma-irradiation on the morphological, structural, thermal, and rheological properties of potato starches. *Carbohydrate Polymers*. 83: 1521-1528.

Song, D., Thioc, Y.S. and Denga, Y. 2011. Starch nanoparticle formation via reactive extrusion and related mechanism study. *Carbohydrate Polymers*. 85: 208-214.

Song, X., Pei, Y., Qiao, M., Ma, F., Ren, H. and Zhao, Q. 2015. Preparation and characterizations of pickering emulsions stabilized by hydrophobic starch particles. *Food Hydrocolloids.* 45: 256–263.

Sriroth, K., Wanlapatit, S. and Oates, C. G. 1998. Improved Cassava Starch Granule Stability. *Starch/Stärke*. 50(11-12): 466-473.

Suarni., Aqil, M dan Frirmansyah, I. U. 2008. Starch characterization of several maize varieties for industrial use in Indonesia. *Proceeding of the Tenth Asian Regional Maize Workshop*. Indonesian Cereal Research Institute (ICERI), Indonesia.

Sun, C. and Gunasekaran, S. 2009. Effects of protein concentration and oil-phase volume fraction on the stability and rheology of menhaden oil-in-water emulsions stabilized by whey protein isolate with xanthan gum. *Food Hydrocolloids*. 23 (1): 165-174.

Sun, Q., Fan, H. and Xiong, L. 2014. Preparation and characterization of starch nanoparticles through ultrasonic-assisted oxidation methods. *Carbohydate Polymers*. 106: 359-364.

Takizawa, F. F., Oliveira, G. D. and Konkel, F.E. 2004. Characterization of Tropical Starches Modified with Potassium Permanganate and Lactic Acid. *Biology and Technology*. 47: 921-31.

Tamuri, A. R., Sahar, M. A., Sarah, N., Abu, A., Lani, N. and Kundel, M. E. 2014. Ultravoilet (UV) Light Spectrum of flourescent lamps Ultravoilet (UV) Light Spectrum of flourescent lamps. 1-5.

Tan, Y., Xu, K., Li, L., Liu, C., Song, C. and Wang, P. 2009. Fabrication of size-controlled starch-based nanospheres by nanoprecipitation. American Chemical Society. *Applied Material Interfaces*. 1: 956-959.

Tan, Y., Xu, K., Liu, C., Li, Y. L., Lu, C. G. and Wang, P. X. 2012. Fabrication of starchebased nanospheres to stabilize pickering emulsion. *Carbohydrate Polymers*. 88 (4): 1358-1363.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Tavares, A. C. K., Zanatta, E., Da Rosa Zavareze, E., Helbig, E. and Dias, A. R. G. 2010. The effects of acid and oxidative modification on the expansion properties of rice flours with varying levels of amylose. *LWT - Food Science and Technology*. 43(8): 1213-1219.

Tereza, P., Souza, D., Lins, V., Barros, B. D. and Simonnot, M. 2009. Potassium permanganate oxidation of phenanthrene and pyrene in contaminated soils. *Journal of Hazardous Materials*. 168: 1269-1273.

Tischer, P. C. S. F., Sierakowski, M. R., Westfahl, H. and Tischer, C. A. 2010. Nanostructural reorganization of bacterial cellulose by ultrasonic treatment. *Biomacromolecules*. 11: 1217-1224.

Tomasick, P. and Zaranyika, M. F. 1995. Nonconventional methods on modification of starch. Dalam *Advances in carbohydrates chemistry and biochemistry.* London. Academic Press. 243-320.

Tzoumaki, M. V., Moschakis, T., Kiosseoglou, V. and Biliaderis, C. G. 2011. Oil in water emulsions stabilized by chitin nanocrystal particles. *Food Hydrocolloids.* 25 (6): 1521-1529.

Varona, S., Martin, A. and Cocero, M. J. 2009. Formulation of a natural biocide based on lavandin essential oil by emulsification using modified starches. *Chemical Engineering and Processing*. 48: 1121-1128.

Vatanasuchart, N., Naivikul, O., Charoenrein, S. and Sriroth, K. 2005. Molecular properties of cassava starch modified with different UV irradiations to enhance baking expansion. *Carbohydrate Polymers*. 61: 80–87.

Wang, Y. J. and Wang, L. 2003. Physicochemical properties of common and waxy corn starches oxidized by different levels of sodium hypochlorite. *Carbohydrate Polymers*. 52 (3): 207-217.

Wang, H., Singh, V. and Behrens, S.H. 2012. Image charge effects on the formation of pickering emulsions. *J. Phys. Chem*. 3: 2986-2990.

Wei, B., Zhang, B., Sun, B., Jin, Z., Xu, X. and Tian, Y. 2016. Aqueous re-dispersibility of starch nanocrystal powder improved by sodium hypochlorite oxidation. *Food Hydrocolloid.* 52: 29-37.

Weiss, J., Takhistov, P. and McClements, D. J. 2006. Functional materials in food technology. *Food Science.* 71: R107-116

Winarti. C., Sunarti, T. C. dan Richana, N. 2011. Produksi dan Aplikasi Pati Nanopartikel. *Buletin Teknologi Pascapanen Pertanian*. 7 (2): 104-114.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Wurzburg, O. B. 1995. *Modified Starch*. In Alistair, M. *Food Polysaccharides and Their Applications*. Food Science and Technology, USA.

Xiao, H. X., Lin, Q. L., Liu, G. Q. and Yu, F. X. 2012. A comparative study of the characteristics of cross-linked, oxidized and dual-modified rice starches. *Molecules*. 17 (9): 10946-10957.

Xiao, J., Li, Y. and Huang, Q. 2016. Recent advances on food-grade particles stabilized pickering emulsions: fabrication, characterization and research trends. *Trends in Food Science & Technology*. 55: 48-60.

Xu, Y., Huang, Q., Fu, X. and Jane, J-l. 2015. Modification of starch octenylsuccinate by β- amylase hydrolysis in order to increase its emulsification properties. *Food Hydrocolloids*. 48: 55-61.

Ye, F., Miao, M., Jiang, B., Campanella, O. H., Jin, Z. and Zhang, T. 2017. Elucidation of stabilizing oil-in-water Pickering emulsion with different modified maize starch-based nanoparticles. *Food Chemistry*. 229: 152-158.

Yousefhashemi, S. M., Khosravani, A., and Yousefi, H. 2019. Isolation of lignocellulose nanofiber from recycled old corrugated container and its interaction with cationic starch–nanosilica combination to make paperboard. *Cellulose*. 26(12): 7207-7221.

Yu, Y. and Wang, J. 2007. Effect of ɣ-ray irradiation on starch granule structure and physicochemical properties of rice. *Food Research International*. 40: 297-303.

Yu, D. H., Lin, Z. Y. and Li, Y. M. 2013. Octadecenylsuccinic anhydride pickering emulsion stabilized by gemethacryloxy propyl trimethoxysilane grafted montmorillonite. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*. 422: 100-109.

Yusoff, A., Murray, B. S. 2011. Modified starch granules as particleestabilizers of oileinewater emulsions. *Food Hydrocolloids*. 25 (1): 42-55.

Zhang, S-H., Zhang, Y-R., Wang, X-L. and Wang, Y-Z. 2009. High carbonyl content oxidized starch prepared by hydrogen peroxide and its thermoplastic application. *Starch/Starke*. 61: 646-655.

Zhang, Y. R., Wang, X. L., Zhao, G. M. and Wang, Y. Z. 2012. Preparation and properties of oxidized starch with high degree of oxidation. *Carbohydrate Polymer*. 87: 2554-2562.

UNIVERSITAS
GADJAH MADA
PEMBUATAN NANOPARTIKEL PATI JAGUNG DENGAN TEKNOLOGI FOTOOKSIDASI DAN ULTRASONIKASI SERTA PENGUJIANNYA PADA SISTEM EMULSI DAN AQUEOUS LARUTAN GARAM
NIKEN WIDYA PALUPI, Prof. Dr. Yudi Pranoto, STP., MP.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

Zhou, G., Luo, Z. and Fu, X. 2014. Preparations of starch nanoparticles in a water-in-ionic liquid microemulsion system and their drug loading and releasing properties. *Journal of Agricultural and Food Chemistry*. 62: 8214-8220.

Zhou, G., Luo, Z. and Fu, X. 2014. Preparation and characterization of starch nanoparticles in ionic liquid-in-oil microemulsion systems. *Industrial Crops and Products*. 52: 105-110.

Zhou, F., Liu, Q., Zhang, H., Chen, Q. and Kong, B. 2016. Potato starch oxidation induced by sodium hypochlorite and its effect on functional properties and digestibility. *International Journal of Biological Macromolecules*. 84: 410–417.

Zuo, J. Y., Knoerzer, K., Mawson, R., Kentish, S. and Ashokkumar, M. 2009. The pasting properties of sonicated waxy rice starch suspensions. *Ultrasonics Sonochemistry*. 16: 462-468.